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June 2004

### Science-Based Organic Farming: A Resource for Educators

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# Science-Based Organic Farming: A Resource for Educators

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Charles Francis, Mindi Schneider and  
Brad Kindler, Editors

June, 2004

University of Nebraska Cooperative Extension Division



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## Editors' Introduction

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Organic farming is an important and growing part of the U.S. food system. The organic sector has grown by at least 20% per year for the past two decades, and currently shows no indication of slowing in this growth. There is increasing consumer concern about where and how food is produced, and people want to be assured access to safe and healthy food products. Interest and concern about food security, and discussion about the merits of a local food system as compared to the vulnerable globalized marketplace are also becoming increasingly important. In Nebraska we have only limited local information for farmers seeking recommendations on organic farming practices and systems design. Most of our information resides in the organic farming community, or comes from other states.

This collection of resources and references is designed for educators and specialists in Cooperative Extension and other organizations to become better prepared to answer questions from clients in Nebraska. It is also designed to be a first primer for farmers interested in organic farming to become acquainted with the regulations and practices necessary for certification and for designing an efficient organic farming operation. We recognize both the importance of science and the value of farmer experience in bringing the best information possible into this resource handbook. Often the experience comes first, followed by research to validate the practical results in the field or to study the mechanisms of crop growth and response to different systems. This information can be used to design future organic systems.

Organic farming is a complex challenge but a promising alternative for Nebraska farmers seeking additional income through adding value to their natural resources on the farm. In addition to the vagaries of weather and uncertain markets that face all farmers, organic production and marketing includes another series of requirements that must be met in order to be officially certified. The new National Organic Program (NOP, since 2002) provides some uniformity to these requirements and forms the basis for standards discussed in this handbook.

### **What is Organic Farming?**

To understand what organic farming is, it is important to understand what it is not. Several common myths are powerful concepts that may pervade some coffee shop conversation and often abound in the mainstream of agricultural publications. Here we present a few of the myths along with the current reality of organic farming.

**Myth #1:** Organic farmers use no inputs.

**Reality:** Those who practice organic farming methods use different kinds of inputs, and they are qualitatively different from conventional farming. There are no chemical fertilizers or pesticides, and no GMOs allowed in organic farming, but non-chemical methods are substituted for what is used in conventional farming systems.

**Myth #2:** Organic crop yields are always less than conventional.

**Reality:** Lower crop yields may be encountered during the transition from conventional to organic production, but many organic crop producers with experience have yields at least as high as county averages and often above. There is a learning curve for any drastically different method of farming (see Economics section for relevant statistics).

**Myth #3:** Organic farms are mostly small vegetable operations, not real farms.

**Reality:** There are numerous specialized smaller farms growing vegetables, but there are field crop and livestock operations that are certified organic as well. In Sweden, the average organic farm is about twice the size of the average conventional farm.

**Myth #4:** Products from organic farms must receive a premium for this to be profitable.

**Reality:** Although most organic products are marketed through special channels and do receive a premium, some go to local or direct markets with or without premiums. The additional income often is needed to offset higher production costs, especially labor.

**Myth #5:** You must certify the whole farm, not just one field.

**Reality:** Most organic farmers start by certifying a small part of their farms, and often add additional organic acres later as they become more familiar with the systems & markets.

**Myth #6:** Organic farming is only for the counter-culture folks, not real farmers.

**Reality:** Most organic farmers are mainstream people who are seeking a way to produce pesticide-free food and add value to their land and other natural resources. They are seeking new and creative marketing approaches that keep value of the products on their farms and in the local communities.

## **Relationship to Sustainable Agriculture & Agroecology**

There has been substantial attention to the search for sustainable agricultural practices and systems over the past two decades. These are defined as productive and profitable systems that cause minimal negative impact on the environment and result in maximum positive social impacts for families and rural communities. "If the system is not productive and profitable, it is hardly sustainable," is a common statement from farmers. This is certainly true in the short term, the only way we evaluate most systems' success in the current economic environment. But to be sustainable for the long term we have to conserve our production environment -- the soils and other natural resources on which all agriculture depends. And if we create a system that skews the benefits toward a few people in each community, this hardly qualifies as a socially acceptable method of producing food, fiber, and fuel. It is possible that we could create a feudal system that many of our ancestors left Europe to escape. Sustainable systems need to include a thoughtful evaluation of their social impact -- on people, families, and the community.

Agroecology has emerged as a science that deals with the integrated analysis of farming and ranching systems, and has even been defined recently as "the ecology of food systems" (Francis et al., 2003). This definition suggests that we should be concerned with the path of energy and materials from the natural resource base, through the production system, to processing and marketing, and on to the consumer. A life cycle analysis of food systems further compels us to look at where waste is produced in the system, and how this could be reincorporated into the production process. Such an analysis leads us to compare the current dominant global food chain, with its one-way, flow through of materials and value, with local food systems alternatives that recycle materials and convert what we now consider wastes into resources.

So, is an organic farming system sustainable? The answer is yes, and no, and maybe! If the system is well designed, using renewable energy and other resources on the farm, and the markets are accessible and bring the maximum possible value back to the farm, organic systems could very well be sustainable for the long term. On the other hand, an organic system that is poorly managed, uses extravagant equipment and exotic imported inputs, and has little thought given to creative marketing is likely to be highly unsustainable. Most farmers would say, "Maybe." If the planning is good, there is adequate information about production alternatives and access to markets, and the weather cooperates, then maybe the organic system can be sustainable. Sounds like something that a non-organic farmer would say about non-organic farming.

## What is in the handbook?

In this resource book we attempt to anticipate as many questions as possible that educators and advisors will hear from clients. We start with the history of organic farming, since that lays the foundation for where we are today. There are sections on the certification regulations and how they are administered, and these are covered in detail in our workshops by experts from a local certifying agency. Sections on organic crop management, soil fertility, and plant protection bring together the practices that must be integrated into production systems. Organic livestock production is a growing interest to meet consumer demand, and we present information that applies to beef and dairy, swine and poultry systems. A section on organic gardening is included in anticipation of small-scale organic questions from clients. Finally, a section on marketing organic products, local food systems, and the economics of organic farming rounds out the resource. There are appendices with the National Organic Program standards, the OCIA requirements as one example of a certification procedure, the 2004 Guide to Nebraska Fresh Produce, and a newsletter from the Organic Farming Research Foundation.

This is a work in progress. We present the information in a loose-leaf binder so that you can add materials and change others as new publications become available. We have chosen to use one-sided printing to provide space for individual notes and ideas. We hope this will become a living resource on your desk, and that you will share with us any information you find especially relevant for Nebraska.

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June 2004

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### **IFOAM Basic Standards for Organic Farming (IFOAM, 2002)**

[Table adapted from Rebecka Milestad, 2003, Swedish Univ. Agricultural Sciences]

The organization that works to standardize organic certification rules is the International Federation of Organic Agriculture Movements (IFOAM), an umbrella group over national certification groups. Organic production and processing generally is based on these principles and ideas, most of which are incorporated into the rules of the many local and national certification groups around the world. Organic farming is designed:

- **to produce sufficient quantities of high quality food, fiber, and other products.**
- **to work compatibly with natural cycles and living systems through the soil, plants and animals in the entire production system.**
- **to recognize the wider social and ecological impact of and within the organic production and processing system.**
- **to maintain and increase long-term fertility and biological activity of soils using locally adapted and available cultural, biological and mechanical methods as opposed to reliance on outside inputs**
- **to maintain and encourage agricultural and natural biodiversity on the farm and nearby areas through use of sustainable production practices and protection of plant and wildlife habitats.**
- **to maintain and conserve genetic diversity through attention to on-farm management of genetic resources.**
- **to promote the responsible use and conservation of water and all life therein, and preserve water quality on the farm and in the watershed.**
- **to use renewable resources to the greatest extent possible in production and processing systems and avoid pollution and waste.**
- **to foster local and regional production and distribution of food and other products, in contrast to a global food system.**
- **to create a harmonious balance between crop production and animal husbandry and production, integrating the two types of enterprises in efficient mixed systems.**
- **to provide living conditions that allow animals to express the basic aspects of their innate behavior, and to maintain concern for animal welfare**
- **to utilize biodegradable, recyclable, and recycled packaging materials, and to minimize packaging to that level consistent with maintaining a quality product.**
- **to provide everyone involved in organic farming and processing with a quality of life that satisfies their basic needs, within a safe, secure, and healthy working environment.**
- **to support the establishment of an entire production, processing and distribution process that is both socially just and ecologically responsible.**
- **to recognize the importance of, protect, and learn from, indigenous knowledge and traditional farming systems.**

IFOAM. 2002. Basic standards for organic production and processing. Final Draft 2002.

<http://www.ifoam.org/standard/norms/ibs.pdf>

Milestad, Rebecka. 2003. Building farm resilience: prospects and challenges for organic farming. Acta Universitatis Agriculturae Sueciae, Agraria 375, Swedish Univ. Agric. Sciences, Uppsala, Sweden.

# History of Organic Farming

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## 1. Early farming systems are examples of organic strategies.

Organic farming essentially has its roots in traditional agricultural practices and systems that have existed since people first settled down from their nomadic lives. The transition from hunting and gathering to a more sedentary life style occurred over hundreds if not thousands of years, at different times in different parts of the globe. One requisite was producing enough food to supplement hunting and gathering from nearby places so that the local food supply would not be exhausted and force people to move again to find needed food. There were obviously no synthetic fertilizers or pesticides, so these were all “organic” systems as we know them today.

[For a good description of hunting & gathering, and how this phased into organized pastoral herding and then into sedentary agriculture, this web site has good visuals and useful text: [http://www.wsu.edu/gened/learn-modules/top\\_agrev/7-Social-Consequences/socialcons2.html](http://www.wsu.edu/gened/learn-modules/top_agrev/7-Social-Consequences/socialcons2.html)]

People settled in areas of fertile soils, adequate rainfall for plant growth, and near enough to rivers or other means of communication to be able to trade their excess goods with people who had other things they needed. The first plant breeders were women who selected the plants with largest seeds, those with good flavor, those that seemed to contribute most to nutrition, and those that did not shed and lose their seeds easily in the field. The selected grains and some tubers could be stored for some time, making it possible to stay in one site longer instead of staying on the move. As people accumulated food and other material goods, it was not possible to move as easily. This also gave rise to writing and other recognized aspects of communities and societies.

[For a good review of how and why technology emerged more quickly in some areas than in others, refer to Jared Diamond’s book *Guns, Germs and Steel: The Fates of Human Societies*, 1997, W.W. Norton]

Many of the early planting systems were much different than our current monoculture grain systems. Because early settled people observed the mixtures of plants in natural ecosystems, they found that planting desirable plants in purposeful mixtures helped the system to reduce insect and disease problems and to use resources efficiently. Much of this early cultivation predates the apparent beginning of organized agriculture some 10,000 to 12,000 years ago. The first fields were likely mixtures of crops, what we would call today “multiple cropping systems” as described by Plucknett and Smith [*Historical Perspectives on Multiple Cropping*, Ch. 2 in C.A. Francis, editor. Multiple Cropping Systems, Macmillan, 1986].

[Definitions of cropping systems may be helpful in guiding people through the literature, The following site from Massachusetts is useful:

Available: <http://www-nix.oit.umass.edu/~psoil791/Cropsyst.htm>]

These early systems for crops and livestock were all organic production strategies according to our definitions today. They provided subsistence for the families practicing an often extensive agriculture, and when there was excess production there was potential for trade. These are the roots of organic farming as we know it, and developments in the 20<sup>th</sup> Century build on many of the biological principles of natural systems that we recognize in undisturbed ecosystems even today: nutrient cycling, limited damage from insects or pathogens due to plant diversity, perennial growth habit of a majority of plants (eg. the native prairie in the Central U.S. and Great Plains ecoregions).

## **2. Entry of science into systems and methods of organic farming**

Agriculturists and researchers in Germany and in the U.K. had early interest in methods of farming that today we recognize as precursors to organic farming. Several notable publications based on travel to other regions of the world were important in the emergence of interest in the organic methods. F.H. King's (1911) travel to Japan, Korea and China, and Albert Howard's (1943) work in India made significant contributions to understanding the methods used for centuries in areas with high population densities and pressure on resources. The early 20<sup>th</sup> Century development of concepts in organic and biodynamic farming were summarized well by Harwood (1983), and his article from a workshop in Tanzania is provided here in full.

Milestad (2003) describes the growth of organic farming – a set of practices and a philosophy that includes both social and ecological goals beyond just production and economics -- as a critique of conventional agriculture. She cites the early work of Rudolph Steiner in Austria in biodynamic agriculture and the establishment of the first farm in 1927, and the organic-biological movement in Switzerland started by Hans and Maria Müller and Hans Peter Rusch. In Great Britain Sir Albert Howard (who worked in India) and Lady Eve Balfour were among the key founders of organic agriculture. Soil fertility was the foundation of most organic systems, but the early proponents also were looking at problems of the industrialization of agriculture, the need for more people to be involved in food production, and a holistic view of nature and farming systems. Key references are given in the Harwood article.

Principles of organic farming are listed in the box on page 4 taken from the IFOAM (2002) statement and regulations. Key issues are avoiding use of synthetic fertilizers or pesticides, and no use of transgenic organisms (popularly called GMOs). Growth of organic farming in the U.S. was greatly stimulated by the publications of J.I. Rodale (1945, 1948) and his son Robert Rodale (1983),

and the magazines *Organic Gardening and Farming* (later called *Organic Gardening*) and *The New Farm* from Rodale Press in Pennsylvania.

### 3. Current status and science-based resources on organic farming

There are currently at least 2.5 million certified organic acres in the U.S., accounting for about 0.3% of total crop and pasture land. About 2% of vegetable production is certified organic (Greene and Kremen, 2003). There is still far less research in the U.S. relative to the acres in organic farming (Sooby, 2003), although this situation is changing rapidly. The Organic Farming Research Foundation web site has up-to-date information on the state of research in the U.S. and grants available (<http://www.ofrf.org/>). See their recent newsletter in the Appendix.

An excellent overview of *Fundamentals of Organic Agriculture* was prepared by Dr. Kathleen Delate at Iowa State University (Delate, 2003). A copy of the ISU publication PM 1880 follows in this section, and a full-color version is available on the web: <http://www.extension.iastate.edu/Publications/PM1880.pdf> Dr. Delate cites the definition of organic agriculture from the National Organic Standards Board of the U.S.D.A.: “*an ecological production management system that promotes and enhances biodiversity, biological cycles, and soil biological activity. It is based on minimal use of off-farm inputs and on management practices that restore, maintain, or enhance ecological harmony. The primary goal of organic agriculture is to optimize the health and productivity of interdependent communities of soil life, plants, animals, and people*” (NOSB, 2003).

The ISU bulletin gives a brief history of organic farming and current statistics, including the over \$10 billion U.S. market as estimated by people in the industry. There is a listing of certifying agencies that are active in Iowa, and a discussion of the new USDA organic labels and their requirements. Marketing is a key issue for organic farmers, and a number of options are described including the rapidly growing community supported agriculture (CSA) movement. There are more than 1000 CSAs across the country, and over 50 in Iowa alone. In Nebraska we currently have three CSAs. The rest of the ISU bulletin describes soil health and pest management, and concludes with specific examples of organic soybean production (also included in a later section of the handbook, ISU PM 1881) and organic apple production. There is a brief description of economics of organic versus conventional production, using food-grade soybeans as the example, showing over 300% more profit from the organic system. This is an up-to-date and relevant bulletin for Nebraska farmers, and a valuable overview of organic farming. We need to tap into these resources from neighboring states, as well as build an information resource base that is unique to Nebraska conditions.

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# Certification for Organic Farming & Processing

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Note: The published extension information on certification for Nebraska is drastically out of date. This section is based on a prior publication by Jane Sooby and David Baltensperger from the Panhandle Research and Extension Center, and reviewed for updating by Chelsea Phillippe in the Spring 2004 class on "Science-Based Organic Farming and Gardening" as part of a semester project. Information is also based on a lecture by Amy Griner, the education coordinator from OCIA International. There is substantial information on current standards in the handbook's Appendices that include the National Organic Program and the OCIA regulations.

## Organic Certification

Until recently, the rules for organic certification varied somewhat depending on the organization that was in charge of setting the rules and conducting inspections. Some states had their own certification rules, and most fell under the umbrella of the IFOAM international organization (see p. 5 in the Introduction section of this handbook). Since October, 2002 we have a national set of standards from the USDA that governs all organic food production and processing in the U.S. There are several levels of official labels that can be used, as described in PM 1800 from Iowa State University. All private certifying organizations must now comply with the provisions of the national standards.

Available: <http://www.ams.usda.gov/nop/indexIE.htm>

A good general source of details on certification, including details on materials that are allowed and not allowed is the OCIA publication included in the handbook, and also from their information available on the web:

Available: <http://ocia.org>

There is also substantial information available on the web at the ATTRA site from the National Sustainable Agriculture Information Service in Fayetteville, Arkansas. This includes some of the documentation forms in electronic format, included in the information from OCIA in this handbook as an example of what each certification agency requires for the certification process:

Available: <http://www.attra.org/organic.html>

Today in Nebraska, there are certified organic fields of wheat, millet, oats, barley, corn, soybean, dry edible beans, and alfalfa. Other minor crops grown and marketed organically include amaranth, blue corn, popcorn, spelt, and many

vegetable species on a small scale. There are fewer organic livestock producers, since certification requires the use of all-organic feed, but there is growing interest in this type of enterprise. There is support in the form of cost share for the certification process, available from the NE State Department of Agriculture [see attachment]:

Available: <http://www.agr.state.ne.us/division/apd/organic.htm>

Under the National Organic Program, in order to sell organic products, a farmer and/or rancher must become certified through a certifying organization. A list of local Nebraska and Midwest certifying agencies can be found at the end of this section. Farmers should search for a certifying agency that would best fit their needs before investing time and money in the certification process. Each group enforces the same regulations under the guidelines of the NOP, according to the type of crop grown and market where the farmer wishes to sell.

### **Steps in Certification**

Details and steps in the certification process are slightly different for each official certifying organization, but since they all operate under the same federal umbrella the process is similar. An example of the details is provided in *Guidance on Putting Your Audit Trail in Place* (OCIA International, Lincoln, NE, CL-W-003, Revision B, 2002) that is included in this handbook. Also included are OCIA forms such as:

- Prior Land Use Affidavit
- Field History Form
- Organic Seed Search and/or Purchase Record
- Non-GMO Affidavit
- Farm Input Record
- Buffer Strip Record
- Farm Equipment Clean-out Record
- Combine Clean-out Affidavit
- Bin Register
- Farm Sales Record Summary
- Request for Certificate Acceptance
- Checklist for Preparing for Inspection
- Yearly Field Activity Log

The certification process begins with the farmer researching a prospective certification organization based on the type of crop, markets, and how the certification agency will help meet the farmer's goals. Once a certification group is chosen, the application process begins. The farmer's responsibility is to develop a farm plan which details the transition the farm will go through to become organic and explains how organic practices will be conducted. It takes

three years for a conventional farm to become organic, due to the requirement of a 36-month period where the farm or land in question must be free of certain synthetic products and practices. The certification organization will provide more specifics on this 36-month transition. In special circumstances, for example land coming out of CRP or long-term alfalfa with no application of prohibited inputs, it may be possible to certify the land immediately. The certification agency reviews the farm plan and makes suggestions.

Once the farm plan is accepted, which may take a couple of drafts, the certification group will have a qualified inspector visit the farm. The inspection includes a tour of the farm and a review of the farmer's audit trail and complete application. The audit trail is basically the documentation of everything that goes on at the farm, as illustrated by the forms attached to this section. The inspector will then give an exit interview with the farmer. The last step is the final review and decision by the certification organization to certify the farm as organic if it sufficiently meets all the criteria. Once the farmer is holding the organic certification, it is legal to sell products with the organic label, but not until then.

The certification standards at the national level were a long time coming. From the passage of the legislation to the drafting of guidelines to the public review process, there was an incredible period of years during which the existing certifying agencies lobbied for their positions and the public weighed in with opinions on what should be allowed and what should not. The public response to a call for commentary on the organic legislation was one of the largest every experienced by the Department of Agriculture.

Especially vocal were the food industry groups that attempted to "water down" the requirements to make them as close as possible to conventional practices. Some of the most contentious issues surrounded use of certain pesticides, soil amendments, and especially the use of transgenic crop varieties (GMOs). There is continuing pressure to change the requirements, and the current administration has pushed for a liberalization of the rules. A recent column from The New York Times, May 27, 2004 represents only the latest in a number of attempts to change the organic food standards or production requirements (page 7 of this section). So far the rules remain intact.

## Contact People and Certification Groups

The Nebraska state contact for the USDA National Organics Program is:

Dan Korber  
 NE Dept. of Agriculture  
 P.O. Box 94947  
 Lincoln, NE, 68509-4947  
 Phone: 800-422-6692  
 Fax: 402-471-2759  
 Email: [Danielak@agr.state.ne.us](mailto:Danielak@agr.state.ne.us)

Here is a listing of available Certification Organizations for Nebraska farmers and ranchers:

**OneCert** 2811 Tennyson Street, Lincoln, NE 68516  
 Contact: Samuel K. Welsch, 402-420-6080  
 E-mail: [sam@onecert.net](mailto:sam@onecert.net) Scope: crop, livestock, wild crop, handling  
 Accredited: 4/22/03

**Organic Crop Improvement Association**  
 6400 Cornhusker, Ste.125, Lincoln , NE 68507  
 Contact: Jeff See, 402-477-2323  
 E-mail: [JSee@ocia.org](mailto:JSee@ocia.org) Website: [www.ocia.org](http://www.ocia.org)  
 Scope: crop, livestock, wild crop, handling Accredited: 4/29/02

Here are some organizations that are available to farmers in other midwestern states:

### Iowa

**Iowa Department of Agriculture** Organic Program, 502 East 9<sup>th</sup> Street  
 Des Moines , IA 50319 Contact: Maury Wills, 515-281-5783  
 E-mail: [maury.wills@idals.state.ia.us](mailto:maury.wills@idals.state.ia.us) Website: [www.state.ia.us/agriculture](http://www.state.ia.us/agriculture)  
 Scope: crop, livestock, wild crop, handling Accredited: 4/29/02

**Certified Organic, Inc.** 500 1<sup>st</sup> St., Keosauqua, IA 52565  
 Contact: Nanette Rambo, 866-581-6428  
 E-mail: [certifiedorg@netins.net](mailto:certifiedorg@netins.net) Web site: [www.certifiedorginc.org](http://www.certifiedorginc.org)  
 Scope: crop, livestock, wild crop, handling Accredited: 11/12/02

**Integrity Certified International**, 2708 Orange Ave., Lenox, IA, 50851  
 Contact: Larry Rayhons, tel. 800-815-7852  
 E-mail: [crayhon@ll.net](mailto:crayhon@ll.net)  
 Scope: crop, livestock, wild crop, handling, Accredited: 4/29/02

Colorado**Colorado Department of Agriculture**

Division of Plant Industry, 700 Kipling Street, Suite 4000  
 Lakewood, CO 80215-8000 Contact: Don Gallegos 303-239-4149  
 E-mail: [Don.Gallegos@ag.state.co.us](mailto:Don.Gallegos@ag.state.co.us)  
 Scope: crop, livestock, wild crop, handling Accredited: 10/16/02

Wyoming**Maharishi Vedic Organic Agriculture Institute**

1431 S. Pennsylvania Ave. Suite 3, Casper, WY 82609  
 Contact: John Konhaus 307-237-1055  
 Fax: 307-237-5547  
 E-mail: [vedicagriculture@maharishi.net](mailto:vedicagriculture@maharishi.net) Website: [www.mvoai.org](http://www.mvoai.org)  
 Scope: crop, livestock, wild crop, handling Accredited: 4/29/02

Wisconsin**Midwest Organic Services Association**

P.O. Box 344, 124 S. Main Street  
 Viroqua , WI 54665 Contact: David Engel, 608-637-2526  
 E-mail: [mosa@mosaorganic.org](mailto:mosa@mosaorganic.org)  
 Scope: crop, livestock, wild crop, handling Accredited: 4/29/02

**American Food Safety Institute (AFSI)**

705 Bay Street, Chippewa Falls, WI 54729  
 Contact: Karl G. Kolb, Ph.D., 715-723-4915  
 E-mail: [info@goafsi.com](mailto:info@goafsi.com) Website: [www.goafsi.com](http://www.goafsi.com)  
 Scope: crop, handling Accredited: 2/10/03

Ohio**Ohio Ecological Food and Farm Administration**

9665 Kline Rd. West Salem , OH 44287-9562  
 Contact: Stephen F. Sears, 419-853-4060  
 E-mail: [organic@oeffa.com](mailto:organic@oeffa.com) Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Global Organic Alliance, Inc.**

P.O. Box 530 Bellefontaine, OH 43311  
 Contact: Betty J. Kananen 937-593-1232  
[kananen@logan.net](mailto:kananen@logan.net) Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

North Dakota**International Certification Services, Inc.**

(dba, Farm Verified Organic and ICS-US)

301 5th Avenue, SE., Medina, ND 58467

Contact: Annie Kirschenmann, 701-486-3578

E-mail: [info@ics-intl.com](mailto:info@ics-intl.com) Website: [www.ics-intl.com](http://www.ics-intl.com)

Scope: crop, livestock, wild crop, handling Accredited: 4/29/02

**Resource Used to Compile this List**

A list of the 93 accredited certifying groups, including those in the U.S. and those in other countries, is available on the USDA web site of the National Organics Program. Although only two of these are currently officed in Nebraska [Integrity Certified International is now in Lenox, Iowa and not in Bellevue, Nebraska as shown on the web site], a number of the organizations are used for certification by Nebraska farmers. It is useful to talk to current organic farmers to assess their experiences with different certifying groups, and to make a good choice that is appropriate for each farm and location. The entire list is included at the end of this section, and can be up-dated by looking at the NOP web site from USDA:

USDA. 2004. National Organics Program: Accredited Certifying Agents.  
<http://www.ams.usda.gov/nop/indexIE.htm>

## **Agriculture Department Rescinds Changes to Organic Food Standards** By MARIAN BURROS, Published: May 27, 2004 – New York Times

Secretary of Agriculture Ann M. Veneman announced yesterday that she was rescinding changes her department made last month to federal organic food standards.

Last month the department's Agricultural Marketing Services issued what it called clarifications of the standards, allowing antibiotics in dairy cows, certain chemicals in pesticides and livestock feed containing nonorganic fish meal. When the changes were announced they created a firestorm in the organic community.

Ms. Veneman acknowledged the reaction at a news conference yesterday.

"There has been a tremendous amount of interest in this, of concern about what it does," Ms. Veneman said. "This is an issue that has come up in the media over the past couple days" and, she added, "we are taking action to rescind what A.M.S. had done."

Critics of the changes said officials had not consulted with the National Organic Standards Board, an advisory panel of experts, as the law requires. Ms. Veneman said those officials would now work with the board to decide how to deal with the issues.

She said, though, that the marketing services had acted in good faith.

The new directives would have permitted organic dairy animals to be treated for disease with any drug, including antibiotics and growth hormones, and remain on an organic farm, as long as the producer waited 12 months to sell milk from those animals.

They would also have allowed the use of fish meal as a feed supplement for organic livestock even though fish meal can contain synthetic preservatives and contaminants like mercury and PCB's.

And they would have permitted the use of certain pesticides even if the inert ingredients of those pesticides are prohibited.

In explaining the directives, department officials had said they were not creating new rules but establishing the limits of existing regulations.

Senator Patrick J. Leahy, Democrat of Vermont and father of the National Organic Program, which set up the standards two years ago, commended Ms. Veneman for her response.

"The secretary has decided to follow the law and to consult with the National Organic Standards Board, and that is welcome news," Mr. Leahy said. "The organic standards and labeling program is still in its infancy, and this is a critical time for its credibility. This program's credibility has been built with full public and stakeholder participation, and we need to keep it that way."

The withdrawal of the directives came the same day Mr. Leahy began circulating a letter to Senate colleagues for signatures, urging the retraction of the moves.

## The National Organic Program

AMS USDA SEARCH

### Accredited Certifying Agents

**Web Site:** <http://www.ams.usda.gov/nop/CertifyingAgents/Accredited.html>

Below is a comprehensive list of the USDA Accredited Certifying Agents. Choose the letter that corresponds with the first letter of the certifying agent of interest, or go through the entire list. A list of [Accredited State Departments of Agriculture](#) only is also available.

Number of domestic accredited certifying agents: 55

Number of foreign accredited certifying agents: 38

**Total:** **93**

Last Updated: May 28, 2004

[A](#) | [B](#) | [C](#) | [D](#) | [E](#) | [F](#) | [G](#) | [H](#) | [I](#) | [J](#) | [K](#) | [L](#) | [M](#) | [N](#) | [O](#) | [P](#) | [Q](#) | [R](#) | [S](#) | [T](#) | [U](#) | [V](#) | [W](#) | [X](#) | [Y](#) | [Z](#) |

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#### [ABCERT GmbH](#)

Martinstr. 42-44  
D - 73728 Esslingen  
Germany  
Contact: Friedrich Lettenmeier  
49 711 35 17 92-0  
E-mail: [info@abcert.de](mailto:info@abcert.de)  
Website: [www.abcert.de](http://www.abcert.de)  
Scope: crop, livestock, wild crop, handling  
Accredited: 11/14/03

#### [American Food Safety Institute \(AFSI\)](#)

705 Bay Street  
Chippewa Falls, WI 54729  
Contact: Karl G. Kolb, Ph.D.  
715-723-4915  
E-mail: [info@goafsi.com](mailto:info@goafsi.com)  
Website: [www.goafsi.com](http://www.goafsi.com)  
Scope: crop, handling  
Accredited: 2/10/03

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#### [Agrior, Ltd.](#)

121 HaChashmonaim Street  
Tel Aviv 67011  
Israel  
Contact: Neri Lahad  
972-3-561-4898  
U.S. Contact: Richard Siegel  
202-518-6364  
E-mail: [agrrior@netvision.net.il](mailto:agrrior@netvision.net.il)  
Scope: crop, handling  
Accredited: 9/10/02

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#### [Australian Certified Organic](#)

ABN 79899 664 781 ARBN 075 676 327  
1 456 Ruthven Street  
Toowoomba QLS 4350  
Australia  
Contact: Quentin Kennedy  
617 4639 3299  
E-mail: [manager@bfa.com.au](mailto:manager@bfa.com.au)  
Scope: crop, livestock, wild crop, handling  
Accredited: 6/7/02

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**Argencert S.R.L.**

Bernardo de Irigoyen 760 - 10° "B"  
(1072) Buenos Aires  
Argentina

Contact: Laura Cecilia Montenegro  
54 11 4334 2943

E-mail: [argencert@argencert.com.ar](mailto:argencert@argencert.com.ar)

Scope: crop, livestock, wild crop, handling

Accredited: 11/8/02

**Austria Bio Garantie**

Koenigsbrunner Strasse 8  
2202 Enzersfeld  
Austria

Contact: Dr. Christian Eis  
+43 2262 67 2212

E-mail: [nw@abg.at](mailto:nw@abg.at)

Web site: [www.abg.at](http://www.abg.at)

Scope: crop, wild crop, handling

Accredited: 12/17/03

**BCS -- Oeko Garantie GmbH**

Cimbernstrasse 21  
90402 Nuernberg  
Deutschland/Germany

Contact: Bernhard Schultz  
+49 911 424390

E-mail: [schultz@bcs-oeko.de](mailto:schultz@bcs-oeko.de)

Scope: crop, livestock, wild crop, handling

Accredited: 4/29/02

**Bioagricert**

Via Facini, 10  
40033 Casalechio di Reno (BO)  
Italy

Contact: Dr. Riccardo Cozzo  
+39 051 6130512

E-mail: [info@bioagricert.org](mailto:info@bioagricert.org)

Scope: crop, livestock, wild crop, handling

Accredited: 1/8/03

**bio.inspecta**

Ackerstrasse  
CH-5070 Frick  
Switzerland

+41 62 865 63 00

Contact: Frank Rumpé

E-mail: [bernd.Jauch@bio-inspecta.ch](mailto:bernd.Jauch@bio-inspecta.ch)

Website: [www.bio-inspecta.ch](http://www.bio-inspecta.ch)

Scope: crop, livestock, wild crop, handling

Accredited 4/15/04

**Bio Latina**

Av. Arenales 645  
Lima 1  
Peru

Contact: Edmundo Miranda Alegria  
51 1 4247772

E-mail: [biolatin@argentina.com](mailto:biolatin@argentina.com)

U.S.: 1501 Farragut St., NW  
Washington, DC 20011

Contact: Verena Fischersworing  
202-726-4216

E-mail: [vere@worldnet.att.net](mailto:vere@worldnet.att.net)

Scope: crop, handling

Accredited: 4/29/02

**Bolicert**

General Gonzales 1314  
Post Office Box 13030  
La Paz  
Bolivia

Contact: Grover Bustillos  
591-2-2490747

E-mail: [bolicert@mail.megalink.com](mailto:bolicert@mail.megalink.com)

Scope: crop, livestock, wild crop, handling

Accredited: 3/13/03

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**California Crop Improvement Association**

Parsons Seed Certification Center  
 One Shields Ave., University of California  
 Davis, CA 95616-8541  
 Contact: Frederick J. Sundstrom  
 530-752-0544  
 E-mail: [FJSUNDSTROM@UCDAVIS.EDU](mailto:FJSUNDSTROM@UCDAVIS.EDU)  
 Website: <http://www.ccia.ucdavis.edu>  
 Scope: crop, handling  
 Accredited: 8/7/02

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**California Organic Farmers Association**

3678 North Modoc  
 Kerman, CA 93630  
 Contact: Laura Horne  
 559-842-5100  
 E-mail: [cofa2000@cofa.net](mailto:cofa2000@cofa.net)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**Canadian Organic Certification Cooperative Ltd.**

Certification Bureau  
 Box 2468  
 Swift Current, Sask. S9H 4x7  
 Canada  
 Contact: Ken Hymers  
 306-778-6451  
 E-mail: [khymers@t2.net](mailto:khymers@t2.net)  
 Website: <http://www.cocert.ca>  
 Scope: crop, livestock, handling  
 Accredited: 4/29/02

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**Canadian Seed Institute**

240 Catherine Street, Suite 200  
 Ottawa, Ontario K2P 2G8  
 Canada  
 Contact: Jim McCullagh  
 613 236-6451  
 E-mail: [csi@storm.ca](mailto:csi@storm.ca)  
 Scope: crop, handling  
 Accredited 9/15/03

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**CCOF Certification Services**

1115 Mission Street  
 Santa Cruz, CA 95060  
 Contact Brian McElroy  
 831-423-2263 ext. 16  
 E-mail: [brian@ccof.org](mailto:brian@ccof.org)  
 Scope: crop, livestock, handling  
 Accredited: 4/29/02

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**Certified Organic, Inc.**

500 1<sup>st</sup> St.  
 Keosauqua, IA 52565  
 Contact: Nanette Rambo  
 866-581-6428  
 E-mail: [certifiedorg@netins.net](mailto:certifiedorg@netins.net)  
 Web site: [www.certifiedorginc.org](http://www.certifiedorginc.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 11/12/02

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**Colorado Department of Agriculture**

Division of Plant Industry  
 700 Kipling Street, Suite 4000  
 Lakewood, CO 80215-8000  
 Contact: Don Gallegos  
 303-239-4149  
 E-mail: [Don.Gallegos@ag.state.co.us](mailto:Don.Gallegos@ag.state.co.us)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 10/16/02

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**Consell catala de la Produccio Agraria Ecologica (CCPAE)**

Sabino de Arana 24  
 Barcelona, Catalonia  
 SPAIN  
 Contact: Amy Prat Solls  
 34 93 409 1122  
 E-mail: [amayaprat@infonegocio.com](mailto:amayaprat@infonegocio.com)  
 Scope: crop, livestock wild crop, handling  
 Accredited: 4/6/04

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**Consorzio Per Il Controllo Dei Prodotti  
Biologici**

Via J Barozzi 8  
40126 Bologna  
Italy  
Contact: Roberto Setti  
+39 516089811  
E-mail: [ccpb@ccpb.it](mailto:ccpb@ccpb.it)  
U.S.: D. Grosser and Associates, Ltd.  
305 Madison Ave., Suite 3120  
New York , NY 10165  
Contact: Donato Grosser  
212-661-0435  
Scope: crop, livestock, wild crop, handling  
Accredited 12/9/02

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**DIO**

(Inspection and Certification Organisation of  
Organic Products)  
38 Aristotelous Str.  
104 33 Athens  
Greece  
Contact: Spiros Sgouros  
+30 1 82 24 384  
E-mail: [cert@dionet.gr](mailto:cert@dionet.gr)  
Scope: crop, livestock, wild crop, handling  
Accredited: 11/13/02

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**ECOCERT SA**

BP 47  
F-32600 L'Isle Jourdain  
France  
Contact: William Vidal  
33 562 0713424  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

**Eco-Logica**

Apartado 132-2020  
Costa Rica  
Contact: Geovanny Delgado Hidalgo  
506-280-6592  
E-mail 1: [ecologic@mail.powernet.co.cr](mailto:ecologic@mail.powernet.co.cr)  
E-mail 2: [ecologica@racsa.co.cr](mailto:ecologica@racsa.co.cr)  
Website: [www.eco-logica.com](http://www.eco-logica.com)  
Scope: crop, livestock, handling  
Accredited:7/9/02

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**ETKO - Ecological Farming Controlling  
Organization**

160 Sk. No. 7/1 35040  
Bornova - Izmir  
Turkey  
Contact: Dr. Mustafa Akyuz  
+90-232-3397606  
E-mail: [info@etko.org](mailto:info@etko.org)  
Scope: crop, wild crop, handling

Accredited: 1/22/03

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**[Fertilizer and Seed Certification Services](#)**

Clemson University  
511 Westinghouse Rd.  
Pendleton , SC 29670  
Contact: David S. Howle  
864-646-2140  
E-mail: [dhowle@clemson.edu](mailto:dhowle@clemson.edu)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

**[Food Safety S.A.](#)**

Varela 183  
(C1406EKC)  
Buenos Aires  
Argentina  
Contact: Dr. Roberto Octavio Rapela  
+54 11 4612-1257  
E-mail: [foodsafety@foodsafety.com.ar](mailto:foodsafety@foodsafety.com.ar)  
Scope: crop, livestock, wild crop, handling  
Accredited: 7/21/03

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**[Georgia Crop Improvement Association, Inc.](#)**

2425 South Milledge Ave.  
Athens , GA 30605  
Contact: Terry Hollifield  
706-542-2351  
E-mail: [georgiacrop@aol.com](mailto:georgiacrop@aol.com)  
Scope: crop, livestock, handling  
Accredited: 4/29/02

**[Global Culture](#)**

P.O. Box 1640  
245 Anchor Way  
Crescent City, CA 95531  
Contact: Linda Van Hook  
707-464-6913  
E-mail: [cvanhook77@earthlink.net](mailto:cvanhook77@earthlink.net)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/14/03

**[Global Organic Alliance, Inc.](#)**

P.O. Box 530  
Bellefontaine, OH 43311  
Contact: Betty J. Kananen  
937-593-1232  
[kananen@logan.net](mailto:kananen@logan.net)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

**[Guaranteed Organic Certification Agency](#)**

5464 Eight St.  
Fallbrook , CA 92082  
Contact: Charles Heermans  
760-731-0496  
E-mail: [Heermans@tfb.com](mailto:Heermans@tfb.com)  
Website: <http://www.goorganics.org>  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

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**[Hawaii Organic Farmers Association](#)**

P.O. Box 6863  
Hilo , HI 96720  
Contact: Kelly Lange or Eileen O'Hora-Weir  
877-674-4632  
E-mail: [hofa@hawaiiorganicfarmers.org](mailto:hofa@hawaiiorganicfarmers.org)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

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**ICEA - Istituto per la  
Certificazione Etica ed Ambientale**

Via Strada Maggiore, n° 29  
40125 Bologna (BO)  
ITALY  
Contact: Daniela Caretto or Alessandro Pulga  
\*\*39 051-27.29.86  
E-mail: [export@icea.info](mailto:export@icea.info)  
Scope: crop, livestock, wild crop, handling  
Accredited: March 13, 2003

**Idaho State Department of Agriculture**

Division of Plant Industries  
P.O. 790  
2270 Old Penitentiary Road  
Boise , ID 83707  
Contact: Margaret Misner  
208-332-8620  
E-mail: [mmisner@agri.state.id.us](mailto:mmisner@agri.state.id.us)  
Scope: crop, livestock, handling  
Accredited: 4/29/02

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**IMO -Germany**

Paradiesstr. 13/Postfach 100 934  
D-78409 Konstanz  
Germany  
Contact: Elisabeth Ruegg  
+49 7531-915 273  
E-mail: [e.ruegg@imo.ch](mailto:e.ruegg@imo.ch)  
Scope: crop, livestock, wild crop, handling  
Accredited: 6/7/02

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**IMO - Institute of Marketecology -  
Switzerland**

Poststrasse 8  
CH 8583 Sulgen  
Switzerland  
Contact: Dr. Rainer Bächli  
+41 71-744 9880  
E-mail 1: [certport@imo.ch](mailto:certport@imo.ch)  
E-mail 2: [fl@imo.ch](mailto:fl@imo.ch)  
Scope: crop, livestock, wild crop, handling  
Accredited: 6/7/02

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**Indiana Certified Organic**

8364 SSR 39  
Clayton , IN 46118  
Contact: Cissy Bowman  
317-539-4317  
E-mail: [cvofo@iquest.net](mailto:cvofo@iquest.net)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

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**Instituto Biodinamico (IBD)**

Rua Prudente de Moraes, 530  
18602-060  
Botucatu/SP  
Brazil  
Contact: Paul Espanion  
+55 14 3882 5066  
E-mail: [ibd@ibd.com.br](mailto:ibd@ibd.com.br)  
Scope: crop, livestock, wild crop, handling  
Accredited: 7/11/02

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**Integrity Certified International**

1308 S. Fort Crook Rd., Ste. 8  
Bellevue, NE 68005  
Contact: Bob Yazowski  
800-815-7852  
E-mail: [ryazowski@aol.com](mailto:ryazowski@aol.com)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

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**International Certification  
Services, Inc.**

(dba, Farm Verified Organic and  
ICS-US)  
301 5th Avenue, SE  
Medina, ND 58467  
Contact: Annie Kirschenmann  
701-486-3578  
E-mail: [info@ics-intl.com](mailto:info@ics-intl.com)  
Website: [www.ics-intl.com](http://www.ics-intl.com)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

**Iowa Department of Agriculture**

Organic Program  
502 East 9<sup>th</sup> Street  
Des Moines , IA 50319  
Contact: Maury Wills  
515-281-5783  
E-mail: [maury.wills@idals.state.ia.us](mailto:maury.wills@idals.state.ia.us)  
Website: [www.state.ia.us/agriculture](http://www.state.ia.us/agriculture)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

**Istituto Mediterraneo Di Certificazione**

Via C Pisacane, 32  
60019 Senigalia (AN)  
Italy  
Contact: Fino Luigi  
+39 (0)717928725  
E-mail: [imcert@tin.it](mailto:imcert@tin.it)  
Scope: crop, livestock, wild crop, handling  
Accredited: 7/21/03

[Top](#)**LACON GmbH**

Weingartenstr. 15  
D – 77654 Offenburg  
Germany  
Contact: Daniela Ratz-Hofmann  
49 781 91937 30  
E-mail: [lacon@lacon-institut.com](mailto:lacon@lacon-institut.com)  
Scope: crop, livestock, wild crop, handling  
Accredited: 10/21/02

**LETIS S.A.**

Presidente Roca 301 PB "B"  
(S2000CXG) Rosario  
Argentina  
Contact: Patricia I. Garcia de Clausen  
54 + 0341 + 4264244  
E-mail: [LETIS@LETIS.COM.AR](mailto:LETIS@LETIS.COM.AR)  
Scope: crop, livestock, wild crop, handling  
Accredited: 12/9/02

[Top](#)**Maharishi Vedic Organic Agriculture  
Institute**

1431 S. Pennsylvania Ave., Suite 3  
Casper, WY 82609  
Contact: John Konhaus  
307-237-1055  
Fax: 307-237-5547  
E-mail: [vedicagriculture@maharishi.net](mailto:vedicagriculture@maharishi.net)  
Website: [www.mvoai.org](http://www.mvoai.org)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

**Marin County**

Agriculture – Weights and Measures  
1682 Novato Bldg., Ste 150-A  
Novato , CA 94947  
Contact: Stacy K. Carlsen  
415-499-6700  
E-mail: [marin.dept.ag@co.marin.ca.us](mailto:marin.dept.ag@co.marin.ca.us)  
Scope: crop, livestock, handling  
Accredited: 4/29/02

**Maryland Department of Agriculture**

50 Harry S. Truman Parkway  
Annapolis , MD 21401  
Contact: Valerie Frances  
410-841-2719  
E-mail: [FranceVL@mda.state.md.us](mailto:FranceVL@mda.state.md.us)  
Scope: crop, livestock, wild crop, handling  
Accredited: 4/29/02

**Mayacert S.A.**

8ª. Calle 6 – 19 "A", Zona 4  
Guatemala, C.A.  
Contact: Noe Rivera Flores  
502- 361-9333  
Fax: 502-332-7607  
E-mail: [mayacert@guate.net](mailto:mayacert@guate.net)  
Scope: crop, livestock, wild crop, handling  
Accredited: 5/27/03

**Midwest Organic Services Association**

P.O. Box 344  
 124 S. Main Street  
 Viroqua , WI 54665  
 Contact: David Engel  
 608-637-2526  
 E-mail: [mosa@mosaorganic.org](mailto:mosa@mosaorganic.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**Minnesota Crop Improvement Association**

1900 Hendon Ave.  
 St. Paul , MN 55108  
 612-625-7766  
 Contact: Brenda Rogers  
 E-mail: [roger007@EOT.com](mailto:roger007@EOT.com)  
 Website: [www.mncia.org](http://www.mncia.org)  
 Scope: crop, handling  
 Accredited: 4/29/02

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**Missouri Department  
of Agriculture**

1616 Missouri Blvd.  
 Jefferson City, MO 65102  
 Contact: Sue Baird  
 573-751-2148  
 E-mail: [Sue\\_Baird@mail.mda.state.mo.us](mailto:Sue_Baird@mail.mda.state.mo.us)  
 Scope: crop, livestock, wild crop, handling  
 Accredited 4/28/03

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**MOFGA Certification Services, LLC**

294 Crosby Brook Rd.  
 P.O. Box 170  
 Unity , ME 04988-0170  
 Contact: Mary Yurlina  
 207-568-4142  
 E-mail: [certification@mofga.org](mailto:certification@mofga.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 6/3/02

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**Montana Department  
of Agriculture**

Agricultural Sciences Division  
 P.O. Box 200201  
 Helena , MT 59620-0201  
 Contact: Doug Crabtree  
 406-444-3730  
 E-mail: [dcrabtree@state.mt.us](mailto:dcrabtree@state.mt.us)  
 Website: [www.agr.state.mt.us](http://www.agr.state.mt.us)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**Monterey County Certified Organic**

County of Monterey Agricultural  
 Commissioner's Office  
 1428 Abbott Street  
 Salinas , CA 93901  
 Contact: Organic Division  
 831-759-7325  
 E-mail: [smithk@co.monterey.ca.us](mailto:smithk@co.monterey.ca.us)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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[Top](#)**NASAA Certified Organic**

Box 768 Stirlingfont 5152  
 South Australia  
 Australia  
 Contact: Lynda Austin  
 61 8 8370 8485  
 E-mail: [admin.manager@nasaa.com.au](mailto:admin.manager@nasaa.com.au)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 10/10/02

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**Natural Food Certifiers**

648 Central Park Ave., Ste. 136  
 Scarsdale , NY 10583  
 Contact: Reuven Flamer  
 845-426-6625  
 E-mail: [NATFCERT@aol.com](mailto:NATFCERT@aol.com)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 10/8/02

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**Naturland e. V.**

Kleinhaderner Weg 1  
 D-82166 Grafelfing  
 Germany  
 Contact: Mildred Steidle/Christina Reifenrath

**Nevada State Department of Agriculture**

350 Capitol Hill Avenue  
 Reno , NV 89502  
 Contact: Randall Bradley  
 775-688-1182, ext. 244

49 89 84 80 82 – 0  
 E-mail 1: [m.steidle@naturland.de](mailto:m.steidle@naturland.de)  
 E-mail 2: [c.reifenrath@naturland.de](mailto:c.reifenrath@naturland.de)  
 Website: <http://www.naturland.de>  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 11/8/02

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-Email: [rbradley@govmail.state.nv.us](mailto:rbradley@govmail.state.nv.us)  
 Website: <http://www.agri.state.nv.us>  
 Scope: crop, handling  
 Accredited: 5/13/02

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**New Hampshire Dept. of Agriculture,  
 Markets & Food**

25 Capitol St.  
 P.O. Box 2042  
 Concord , NH 03302-2042  
 Contact: Victoria M. Smith  
 603-271-3685  
 E-mail: [vsmith@agr.state.nh.us](mailto:vsmith@agr.state.nh.us)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**New Mexico Organic Commodity  
 Commission**

4001 Indian School, NE, Suite 310  
 Albuquerque, NM 87110  
 Contact: Erica Peters  
 505-841-9070  
 E-mail: [erica.peters@state.nm.us](mailto:erica.peters@state.nm.us)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**NOFA -- Massachusetts**

683 River St.  
 Winchendon , MA 01475  
 Contact: Don Franczyk  
 978-297-4171  
 E-mail: [dfranczyk@starpower.net](mailto:dfranczyk@starpower.net)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**NOFA -- New Jersey**

60 S. Main St.  
 P.O. Box 886  
 Pennington , NJ 08534  
 Contact: Karen Anderson  
 609-737-6848  
 E-mail: [certify@nofanj.org](mailto:certify@nofanj.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**NOFA -- New York LLC**

840 Upper Front St.  
 Binghamton , NY 13905  
 Contact: Carol A. King/Lisa Engelbert  
 607-724-9851  
 E-mail: [certifiedorganic@nofany.org](mailto:certifiedorganic@nofany.org)  
 Scope: crop, livestock, handling  
 Accredited: 4/29/02

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**North Carolina Crop Improvement  
 Association**

3709 Hillsborough St.  
 Raleigh , NC 27607-5464  
 Contact: Myron O. Fountain  
 919-515-2851  
 E-mail: [myron.fountain@ncsu.edu](mailto:myron.fountain@ncsu.edu)  
 Website: [www.nccia.ncsu.edu](http://www.nccia.ncsu.edu)  
 Scope: crop, livestock, handling  
 Accredited: 7/9/02

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**Nutriclean --  
 Formerly Scientific Certification Systems**

2000 Powell St. Ste 1350  
 Emeryville , CA 94608  
 Contact: Lenin Ovando  
 510-452-8012  
 E-mail: [lovando@scscertified.com](mailto:lovando@scscertified.com)  
 Scope: crop, livestock, handling  
 Accredited: 4/29/02

[Top](#)**OCPP/Pro-Cert Canada, Inc.**

Box 100A , RR#3  
 Saskatoon , Saskatchewan  
 Canada  
 S7K 3J6  
 Contact: J. Wallace Hamm  
 306-382-1299  
 E-mail: [procertorganic@yahoo.com](mailto:procertorganic@yahoo.com)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 5/24/02

**Ohio Ecological Food and Farm Administration**

9665 Kline Rd.  
 West Salem , OH 44287-9562  
 Contact: Stephen F. Sears  
 419-853-4060  
 E-mail: [organic@oeffa.com](mailto:organic@oeffa.com)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Oklahoma Department of Agriculture**

2800 N. Lincoln Blvd.  
 Oklahoma City, OK 73105  
 Contact: Chad Goss  
 405-522-5898  
 E-mail: [cbgoss@oda.state.ok.us](mailto:cbgoss@oda.state.ok.us)  
 Scope: crop, livestock, handling  
 Accredited: 12/6/02

**OneCert**

2811 Tennyson Street  
 Lincoln, NE 68516  
 Contact: Samuel K. Welsch  
 402-420-6080  
 E-mail: [sam@onecert.net](mailto:sam@onecert.net)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/22/03

**Oregon Tilth**

470 Lancaster Dr.,  
 Salem, OR 97301  
 Contact: Chris Schreiner  
 503-378-0690  
 E-mail: [organic@tilth.org](mailto:organic@tilth.org)  
 Website: [www.tilth.org](http://www.tilth.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Organic Certifiers, Inc**

6500 Casitas Pass Rd.  
 Ventura , CA 93001  
 Contact: Susan Siple  
 805-684-6494  
 E-mail: [organic@west.net](mailto:organic@west.net)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Organic Crop Improvement Association**

6400 Cornhusker, Ste. 125  
 Lincoln , NE 68507  
 Contact: Jeff See  
 402-477-2323  
 E-mail: [JSee@ocia.org](mailto:JSee@ocia.org)  
 Website: [www.ocia.org](http://www.ocia.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Organic Forum International**

37189 532<sup>nd</sup> Ave.  
 Paynesville , MN 56362  
 Contact: Debra Johnson  
 320-276-8760  
 E-mail: [ojohnson@midstate.tds.net](mailto:ojohnson@midstate.tds.net)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Organic Growers of Michigan**

1002 4 - Mile Rd. N.E.  
 Grand Rapids , MI 49525  
 Contact: Grey Larison

**Organizacion Internacional Agropecuaria**

Av. Santa Fe 830 – Acassuso (B1641ABN)  
 Buenos Aires  
 Argentina

616-361-7117  
 E-mail: [OGM@MichiganOrganic.org](mailto:OGM@MichiganOrganic.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 5/13/02

Contact: Pedro Landa  
 54 11 4793-4340  
 E-mail: [oia@oia.com.ar](mailto:oia@oia.com.ar)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 10/16/02

**Organic National and International  
 Certifiers**

9415 Kramerwood Place  
 Los Angeles, California 90034  
 Contact: Howard Sharfman  
 310-287-1449  
 E-mail: [BeOrganic@organicnandi.com](mailto:BeOrganic@organicnandi.com)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/28/04

**Organic Producers Association of  
 Manitoba Cooperative, Inc.**

#101-247 Wellington Street West  
 P.O. Box 940  
 Virden, MB  
 CANADA R0M 2C0  
 Contact: Lara Scott  
 204 748-1315  
 E-mail: [info@opam.mb.ca](mailto:info@opam.mb.ca)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 1/8/03

[Top](#)

**Pennsylvania Certified Organic**

406 South Pennsylvania Avenue  
 Centre Hall , PA 16838  
 Contact: Leslie Zuck  
 814-364-1344  
 E-mail: [leslie@paorganic.org](mailto:leslie@paorganic.org)  
 Website: [www.paorganic.org](http://www.paorganic.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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**Quality Assurance International**

9191 Towne Centre Drive, Ste. 510  
 San Diego , CA 92122  
 Contact: Griff McLellan  
 858-792-3531  
 Fax: 858-792-8665  
 E-mail: [gai@gai-inc.com](mailto:gai@gai-inc.com)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Quality Certification Services --  
 Formerly FOG**

P.O. Box 12311  
 Gainesville , FL 32604  
 Contact: Marty Mesh  
 352-377-6345  
 E-mail: [fogoffice@aol.com](mailto:fogoffice@aol.com)  
 Website: [www.QCSinfo.org](http://www.QCSinfo.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**QCB Organic, Inc.**

Ste. # 103 Advanced Technology Centre  
 9650-20 Ave.  
 Edmonton , Alberta  
 Canada T6N 1G1  
 Contact: Tim Purnell

**QC&I Gesellschaft fur Kontrolle und  
 Aertifizierung von  
 Qualitatssicherungssystemen GmbH**

Mechtildisstrasse 9  
 D-50678  
 Köln, Germany

780-496-2463  
 E-mail: [info@gcborganic.com](mailto:info@gcborganic.com)  
 Website: [www.gcborganic.com](http://www.gcborganic.com)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 9/10/02

Contact: Cornelia Hoicke  
 +49 221 9439209  
 E-mail: [mpickel@gci.de](mailto:mpickel@gci.de)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 10/10/02

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**Rhode Island Department of Environmental  
 Management**

Division of Agricultural and Resource  
 Marketing  
 235 Promenade St.  
 Providence, RI 02908  
 Contact: Dan Lawton  
 401-222-2781  
 E-mail: [dlawton@dem.state.ri.us](mailto:dlawton@dem.state.ri.us)  
 Scope: crop and handling  
 Accredited: 10/22/02

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**Saskatchewan Organic Certification  
 Association, Inc.**

Box 2293 Tisdale Sk.  
 Canada SOE 1 T0  
 Contact: Russell Plamondon  
 306-873-2207  
 E-mail: [p.and.e@sympatico.ca](mailto:p.and.e@sympatico.ca)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 9/17/02

**SGS Product & Process Certification**

P.O. Box 200  
 3200 AE Spijkennisse  
 Netherlands  
 Contact: Edwin Aalders  
 31 181 693279  
 E-mail: [Edwin.Aalders@sgs.com](mailto:Edwin.Aalders@sgs.com)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 7/9/02

**Skal International**

P.O. Box 161  
 Dr. Klinkertweg 28a  
 8000 AD Zwolle  
 Netherlands  
 Contact: Johan C. Maris  
 +31 38-4260100  
 E-mail: [gacs@skalint.com](mailto:gacs@skalint.com)  
 Website: <http://www.skalint.com>  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 10/18/02

**Stellar Certification Services**

Britt Rd.  
 Aurora , NY 13026  
 Contact: Anne Mendenhall  
 315-364-5617  
 E-mail: [scs@baldcom.net](mailto:scs@baldcom.net)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

**Stichting Skal**

P.O. Box 384  
 Dr. Klinkertweg 28a  
 8000 AJ Zwolle  
 Netherlands  
 Contact: Jolanda Bergsma

**Suolo E Salute SRL**

Via don Minzoni, S  
 40037 Sasso Marconi  
 Bologna, Italy  
 Contact: Bruno D'Aprile  
 +39 051-6751265

++31-38-426 81 81  
 E-mail: [jb@skal.nl](mailto:jb@skal.nl)  
 Website: <http://www.skal.nl>  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 10/16/02

E-mail: [assdt@tiscalinet.it](mailto:assdt@tiscalinet.it)  
 Website: <http://www.suoloesalute.it>  
 Scope: rop, livestock, wild crop, handling  
 Accredited: 2/4/03

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#### **Texas Department of Agriculture**

Organic Certification Program  
 P.O. Box 12847  
 Austin , TX 78711  
 Contact: Leslie McKinnon  
 512-475-1641  
 E-mail: [leslie.mckinnon@agr.state.tx.us](mailto:leslie.mckinnon@agr.state.tx.us)  
 Scope: crop, livestock, handling  
 Accredited: 4/29/02

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#### **Utah Department of Agriculture**

350 North Redwood Rd.  
 Box 146500  
 Salt Lake City, Utah 84114  
 Contact: Seth R. Winterton  
 801-538-7141  
 E-mail: [sethwinterton@utah.gov](mailto:sethwinterton@utah.gov)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

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#### **Vermont Organic Farmers, LLC**

P.O. Box 697  
 Richmond , VT 05477  
 Contact: John Cleary  
 802-434-4122  
 E-mail: [vof@nofavt.org](mailto:vof@nofavt.org)  
 Website: [www.nofavt.org](http://www.nofavt.org)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 9/24/02

#### **Virginia Department of Agriculture**

P.O. Box 1163  
 Richmond , VA 23218  
 Contact: Thomas H. Smith  
 804-786-3549  
 E-mail: [Tsmith@vdacs.state.va.us](mailto:Tsmith@vdacs.state.va.us)  
 Scope: crop, livestock, handling  
 Accredited: 4/29/02

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#### **Washington State Department of Agriculture**

P.O. Box 42560  
 Olympia , WA 98504-2560  
 Contact: Miles McEvoy  
 360-902-1924  
 E-mail: [Organic@agr.wa.gov](mailto:Organic@agr.wa.gov)  
 Scope: crop, livestock, wild crop, handling  
 Accredited: 4/29/02

## **Organic Crop Management**

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Management of organic cropping systems requires careful manipulation of the production environment in order to maintain adequate soil fertility, minimize weed and insect pest problems, and cope with residue in the field while maintaining as much soil moisture as possible. There are some guidelines or requirements in the design of rotations within the organic certification rules, and many common-sense elements in the design of cropping systems. In this section we discuss choice of crop and cultivar, seed sources, crop rotations, land preparation and residue management, planting dates and patterns and densities, and overall system planning. Managing soil fertility and controlling crop pests are covered in separate sections of the handbook, since these topics are of vital interest to farmers making the conversion from conventional to organic production systems. Several key publications are included in this section to illustrate the wealth of information available on the web and from Cooperative Extension and other sources in the Midwest.

One of the most valuable web sites and information resources available is ATTRA, the Applied Technology Transfer to Rural Areas in Fayetteville, Arkansas. This is now more widely known as the National Sustainable Agriculture Information Service, created and managed by the National Center for Appropriate Technology (NCAT). Funded with a grant from the USDA, this center depends on annual appropriations through Congress and each year there is some pressure to reduce or eliminate their funding. Any support you can provide to keep this information service up to date and functioning well is highly appreciated – this can be done through your senators and representatives in each state. Information from the center is available by phone, by fax, and most quickly and readily accessed through the web site:

Available: <http://www.attra.org/> [Site Map attached here]

Their ***Organic Farming*** section with hot links to a wide range of resource materials is organized into sections on:

- Organic Regulation, Certification, Transition and History
- [Organic Fruits](#)
- [Organic Vegetables, Flowers and Herbs](#)
- [Organic Field Crops](#)
- [Organic Livestock](#)
- [Organic Control of Pests](#)
- [Organic Soils & Fertilizer Issues](#)
- [Organic Marketing](#)

In addition to more than 80 hot links to specific farm practices for organic crop and livestock production, there are links to other web sites and

organizations that have organic farming organizations including certification groups, National Organic Program (NOP), the Food & Agriculture Organization of the UN (FAO), the Organic Farming Research Foundation (OFRF – see recent newsletter in the Appendix section), the Organic Trade Association, the Organic Consumers group, USDA and its Economic Research Service (ERS), and other state sites that have emphasis on organic farming.

Available: <http://www.attra.org/organic.html> [Site Map attached here]

### **Choice of Crops, Cultivars, and Seed Sources**

As with any decisions on crop management, some of the most important are the choice of adapted crops that have a ready market, choices of specific hybrids or varieties to plant, and in the case of organic production, the sources of seed that are available. There is some comfort in growing crops that are well known and with which we have experience – corn, soybeans, grain sorghum, wheat, alfalfa – and there is an established organic market for these crops if one is willing to invest the time and energy to seek out buyers. Often this means finding contracts with reputable dealers before the crop goes into the ground. Most successful organic farmers are seeking more diversity, and producing crops that are in demand in the marketplace but are not currently being produced locally. Most information on crop choice for organic systems can be gleaned from the conventional literature and Extension recommendations, since the top varieties in one system are likely the best ones in most other systems.

Choice of varieties and seeking available seed sources is another matter. Researchers are in the process of testing the genotype by system interaction to find whether some cultivars in fact respond better in organic systems than in conventional crop production systems. We do know that there are some specific traits that will help a variety do well in an organic system – for example the capacity to germinate quickly and develop a competitive crop canopy to compete with weeds. Although this is an important trait for any system, it is especially important when dealing with weeds in a number of integrated ways that do not include herbicide application. Often, organic farmers will delay planting to allow early-season control of weeds, and this will require a shorter-season cultivar in the organic cropping system. Since organic seed is not available for many minor crops, nor of adapted cultivars of some major crops, farmers are faced with the decision of choosing the best variety for which organic seed is available, or changing to a less-adapted variety that has cheaper or available seed. If there is any doubt about the acceptability of a seed source within the rules of certification, a producer is urged to check with the certification group. Information from the ATTRA web site on characteristics of seed and organic seed sources is available at their web site, and a portion of the information follows this section.

Available: <http://www.attra.org/organic.html> “Suppliers of Seed for Certified Organic Production”

There is particular interest in finding seed that is free of GMOs, since this type of cultivar is prohibited by certification rules. An organization and newsletter called the *Non-GMO Source* is available with the latest news on GMOs, tolerance levels, and other legal issues that are in the news. A copy of the most recent newsletter is attached.

Available: <http://www.non-gmosource.com>

One of the largest organic seed producers is NC+ Hybrids in Lincoln, Nebraska. They market corn, soybeans, grain sorghum, and forages.

Available: <http://www.ncorganics.com/>

## **Crop Rotations**

The NOP rules include a section on crop rotations (paragraph 205.205) that states “The producer must implement a crop rotation including but not limited to sod, cover crops, green manure crops, and catch crops that provide the following functions that are applicable to the operation (p. 16-17, NOP, 2002):

- Maintain or improve soil organic matter content;
- Provide for pest management in annual and perennial crops;
- Manage deficient or excess plant nutrients;
- Provide erosion control.”

It is obvious in designing crop rotations that one size does not fit all, and the OCIA regulations specify that any single set of guidelines or rules for specific crops would scarcely be applicable to the wide range of climates, soils, and agroecoregions where farmers are certified to produce organic crops. There are regional guidelines for rotations, and these are set by each local chapter in the case of OCIA.

General guidelines would include rotation of unlike crops to maximize the potential for weed management (described in a later section), including rotation of cereals with legumes, summer crops with winter crops, or annual crops with perennial crops. This type of cropping sequence helps with management of weeds that are specifically adapted to field conditions in one crop species. The worst possible scenario is to plant the same species consecutively in the same field, a practice that is highly discouraged in organic farming and is only allowed under very unusual circumstances. The potential for weed buildup and for weed resistance to herbicides should be a real concern for conventional farmers as well, and either continuous culture of the same crop or even use of the same herbicide (eg. Roundup©) should be avoided for this reason. The natural development of chemical resistance in weeds is assured in such a system. Organic rotational systems seek to avoid this type of problem through biodiverse cropping systems and cover crops in the off-season to provide cover and compete with unwanted species.

There are many research publications and ongoing projects to study organic crop rotations. A quick search on the web will reveal a number of studies from Canada and European countries as well as the U.S., and extensive publication lists, for example:

Available:

[http://www.organiccentre.ca/ResearchDatabase/ext\\_weed\\_rotations.html](http://www.organiccentre.ca/ResearchDatabase/ext_weed_rotations.html)

<http://www.farm-garden.com/primers/2/crop-rotation.htm>

<http://www.sac.ac.uk/cropsci/External/OrgServ/OrgPublications/PubsCrop.asp>

## **Land Preparation and Residue Management**

There is little specific information on unique land preparation guidelines for organic farming systems, since most of the same principles and practices from conventional farming apply to organic systems as well. The goals of basic tillage are to prepare a seedbed for the subsequent crop, and much research and education has been done to convince farmers that there is little need for preparation of the entire field when the seed will be planted in a narrow band that is 30 inches or more from the next narrow seedbed strip across the field. For this reason and to preserve moisture, many farmers in the western cornbelt have moved to reduced tillage or no-till systems. Leaving previous crop residues on the soil surface helps reduce the impact of rain that dislodges soil particles that often leave the field through water flow and soil erosion. Having an irregular residue pattern on the surface also reduces potential for wind erosion of soil particles and thus further protects against soil loss. The challenge in these systems for organic farmers is weed management, when it is not possible to spray an herbicide across the field to eliminate unwanted species. One solution has been use of ridge till with no prior land preparation before planting (Thompson, 1999) and scalping off the top of the ridge just in front of the no-till planter units. Weeds in the row are controlled with one or two passes of the rotary hoe and weeds between the row during a hilling up pass with a no-till cultivator. This is one of the few methods that appears to work well with no chemical applications. For articles from *The New Farm* on the Thompson experience, see

[http://www.newfarm.org/depts/iowa\\_pioneers/1102/thompsons/index.shtml](http://www.newfarm.org/depts/iowa_pioneers/1102/thompsons/index.shtml)

Other references can be found on the web for no-till organic production.

Available: <http://www.newfarm.org/features/0104/no-till/index.shtml>

<http://attra.ncat.org/atrapub/organicmatters/conservationtillage.html>

<http://www.sare.org/publications/diversify/diversify03b.htm>

<http://wsare.usu.edu/projects/2003/SW01-048A.pdf>

## Planting Dates, Planting Patterns, and Planting Densities

There are specific reasons why planting dates, more diverse planting patterns, and higher planting densities may be used in organic cropping systems. Often organic farmers plant summer annual crops later than the optimum date for conventional systems in order to use one or more cultivations to control the first flushes of weeds in the spring. In this case it may be necessary to plant a variety with a shorter time to maturity. Sunflowers may be planted later than normal to avoid attacks by the head moth. Specific examples of planting date decisions for pest management are found in a later section. One unique application of different planting dates could be to avoid contamination of an organic crop by pollen from GMO hybrids in nearby fields. Enough separation of planting dates could solve the problem if the GMO crops were planted at the normal early date, and the organic crops to be protected were delayed in planting by several weeks. The challenge of pollen drift and the legalities of liability are yet to be resolved, and these problems are a topic of many conversations in the organic farming community. For an example of a recent article:

Available:

[http://www.newfarm.org/depts/iowa\\_pioneers/1102/thompsons/index.shtml](http://www.newfarm.org/depts/iowa_pioneers/1102/thompsons/index.shtml)

Some planting patterns can add diversity to the in-field environment and help protect against pests. Strip cropping, relay systems, annual/perennial crop combinations, and different crop planting dates can all create a non-uniform in-field biological system that can interrupt movement of vectors and insect pests. Just the move away from a large, monoculture field may be enough to discourage the reproduction of some pest populations. These practices may be enough to maintain pest populations below the economic threshold. Organic farmers practice other methods of control as described in a later chapter. Some references on diverse planting patterns are:

Available: [http://www.eap.mcgill.ca/MagRack/AJAA/AJAA\\_5.htm](http://www.eap.mcgill.ca/MagRack/AJAA/AJAA_5.htm)

<http://www.peisland.com/agrtour/xslope.html>

<http://www.forestry.iastate.edu/res/stripcropping.html>

In organic cropping systems where some type of weed management such as the rotary hoe will be used, farmers often increase the rate of seeding by 10-20% to compensate for the loss of some plants during the cultivation operation. This is a common practice for ridge-tilled corn or soybeans in the Midwest, where there is no use of chemical herbicides. Although not popular in the U.S., there is often one or two spring cultivations on winter cereals in Europe to control emerging annual weeds. The flexible tine cultivator spikes wander around the crowns of the overwintered rye, wheat, or barley, and there is relatively little damage to the crop. Again, there may be need to increase planting density to compensate for lost crop plants. Some references are on the web:

Available:

[http://www.eap.mcgill.ca/CPW\\_7%20htm.htm](http://www.eap.mcgill.ca/CPW_7%20htm.htm) [advantage of winter cereal]

<http://www.sac.ac.uk/cropsci/External/ORGANIC/OFTS/ofts9.pdf>

<http://www.acornorganic.org/pdf/cashcropprofile.pdf>

## **Overall Cropping Systems Design**

A good example of organic practices and recommendations for one Midwest crop is the Iowa State University bulletin on organic soybean production by Kathleen Delate (PM1881, August 2003) copy attached, or available:

<http://www.extension.iastate.edu/Publications/PM1881.pdf>

A practical alternative that can speed the conversion process is to certify land that has previously been in the CRP program. Again there are recommendations from Iowa State University on how to farm these lands in the first year with soybeans:

Available: <http://extension.agron.iastate.edu/sustag/resources/soycrp.html>

It is this type of Extension publication that is badly needed for all of our major crops, and even more important will be the development of thoughtful, creative, and practical publications on design of overall cropping systems, especially those that incorporate crops and animals on mixed farms. Most experiences will come from farmers, and one role of Cooperative Extension can be to record, evaluate, and publicize the most useful results for other farmers to use.

## **On-Farm Testing**

In the absence of research results on organic practices and systems, and knowing that most effective systems will be specific to place and circumstances of each farm, many organic farmers have taken on their own research. Methods are available:

Available: <http://www.ofrf.org/research/On-farm.Research.Guide.PDF>

[attached here]

## References and Resources

Thompson, R. 1999. Alternatives in agriculture. Thompson On-Farm Research and Wallace Institute, 2035 190<sup>th</sup> St., Boone, IA 50036-7423. [and other years of same publication] Available:  
[http://www.newfarm.org/depts/iowa\\_pioneers/1102/thompsons/index.shtml](http://www.newfarm.org/depts/iowa_pioneers/1102/thompsons/index.shtml)

## Soil Fertility for Organic Crop Production

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Guidelines for maintaining soil fertility and the recommended crop nutrient management practices, as well as allowable and prohibited materials are given in the NOP (2002) rules in paragraph 205.203 [copy appended in this handbook]. Much of the early work on organic farming systems centered on establishing and maintaining a healthy soil. This was described in the history section in the observations of F.H. King who found that the “farmers of forty centuries” in China and elsewhere in East Asia had kept soil nutrients at adequate levels by cycling nutrients within the farming and human community, including re-use of all organic materials and human wastes. The work of Sir Albert Howard in India, and subsequent reports from the U.S., U.K., and Europe, all placed soil fertility at the top of the list of challenges for productive organic systems.

References: King, F.H. 1911. *Farmers of forty centuries*. Rodale Press, Emmaus, PA.

Howard, A. 1943. *An agricultural testament*. Rodale Press, Emmaus, PA.

Harwood, R.R. 1983. International overview of regenerative agriculture.

[article appended to history section of this handbook]

A primer on soil ecology is a useful foundation for discussion of maintaining soil fertility for crop production. The section by Bird, Berney, and Cavigelli in the *Michigan Field Crop Ecology* publication from Cooperative Extension (MSU Extension Bull. E-2646, 1998) is an excellent resource for those interested in starting to design a strategy for an organic soil fertility program [appended to this section]. They describe the components of soil: minerals, water, air, and organic matter, and how these interact with soil management to provide different types of soil texture. The biotic components include plant roots, soil bacteria, fungi, actinomycetes, nematodes, arthropods, earthworms, and others that provide 3,000 to 15,000 pounds per acre of biomass in roots alone, and an additional 1,300 to 13,000 pounds per acre of biomass in the living and dead soil organisms. Subsequent sections in their bulletin give more detail on soil carbon and soil nitrogen, and how these nutrients interact in complex cropping systems.

Reference: Cavigelli, M.A. et al (editors). 1998. *Michigan Field Crop Ecology: Managing Biological Processes for Productivity and Environmental Quality*. Michigan State Univ. Ext. Bull. E-2646. 92 pp. [available from MSU Cooperative Extension, \$12]

Web site for MSU Publications:

<http://web2.msue.msu.edu/bulletins/subjectsearch.cfm>

In general, the guidelines from the NOP (2002) describe a common sense approach to maintaining soil health and fertility with such suggestions as “select and implement tillage and cultivation practices that maintain or improve the physical, chemical and biological condition of the soil and minimize soil erosion.”

This is good advice for any farming system. Crop nutrients must be managed “through rotations, cover crops, and the application of plant and animal materials.” The organic matter must be managed so as not to contaminate the soil with heavy metals, pathogens, or prohibited substances. There are specific rules on application of manure and compost, as described below. The guidelines for applied materials include these approved substances:

- Crop nutrients or soil amendments that are on the list of allowed materials;
- Mined substances of low solubility;
- Mined substances of high solubility as long as they are on the approved list;
- Ash from burning plant or animal material, except as prohibited on the list; and
- Plant or animal material that has been chemically altered, as long as it is approved.

Some specific prohibitions in the soil amendment area include:

- Fertilizer or composted material that includes a synthetic substance not approved;
- Sewage sludge; and
- Burning to dispose of crop residues, except to suppress disease spread or enhance seed germination.

If there are any doubts about what is allowed or not allowed, the farmer is urged to consult with the certifying group to be sure a practice is OK before using a specific material. A good overview of soil quality and soil fertility is provided by the Iowa State University Bulletin 1882 compiled by Kathleen Delate et al. This is available on line, and is attached in hard copy format here in this section of the handbook:

Available: <http://www.extension.iastate.edu/Publications/PM1882.pdf>

## **Crop Rotations**

Crop rotations are so important to the organic system that they are discussed in several sections of the handbook. Rotations of cereals with legumes can result in a sustainable soil nutrient situation, but only if enough legumes are present in the sequence to provide for the high nitrogen use of the cereals. For example, soybean is a common legume in Midwest crop rotations, yet the crop extracts more nitrogen with the harvest than the crop can fix during the growing season. It has been called a “nitrogen sparing crop” because of soybean’s lower needs for nitrogen compared to corn and other cereals. In general, crop rotations are part of the biological structuring of a whole-farm cropping and crop/animal system which includes the choice of crops and crop cultivars, crop sequence, and management practices that use our understanding of biological processes including the emergent properties of complex systems.

## References:

C.A. Francis and M.D. Clegg. 1990. Crop rotations in sustainable production systems. Ch. 8 in: Sustainable Agricultural Systems, C.A. Edwards et al.(editors). Soil & Water Conservation Society, Ankeney, Iowa. P. 107-122.

The ATTRA website (url given below) describes the importance of forage legumes to a crop rotation, a difficult component to manage unless the farmer is equipped for alfalfa production. With the exodus of livestock from most Midwestern farms, there is no demand for forage unless there is an over-riding reason to include such crops in the rotation. Organic systems provide this compelling reason, since there is need to capture nitrogen through N fixation by legumes. There is more difficulty generating the nitrogen needed for heavy N consumers such as corn if there are no forage legumes in the crop sequence and no livestock on the farm. Some organic farmers, for example Jim Bender in Nebraska, maintain that it is nearly impossible to establish an adequate nutrient base in organic farms without livestock (See his book, *Future Harvest*).

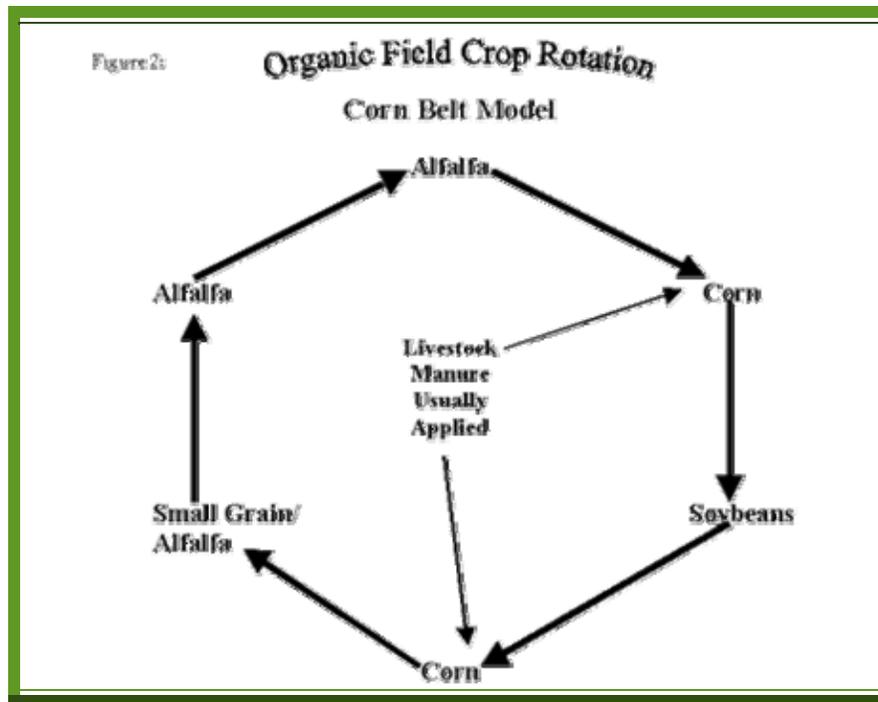
## References:

Jim Bender. 1994. *Future Harvest: Pesticide-Free Farming*. Nebraska Press, Lincoln, Nebraska.

Crop rotations are described on the ATTRA web site, along with substantial information about other practices and systems for organic farming:

Available: <http://attra.ncat.org/attra-pub/organiccrop/tools2.html>

The Figure below shows one example of a crop rotation that may be used successfully on organic farms in the Midwest.



Source: ATTRA website.

Here are the summary points made on the ATTRA site about this generalized rotation (items taken directly from the web site):

- Legumes fix nitrogen in the soil, providing for subsequent non-legumes in the rotation.
- Several insect pest cycles are interrupted, especially that of the northern and western rootworm species, which can be devastating to corn.
- Several plant diseases are suppressed, including soybean cyst nematode.
- Weed control is enhanced as perennial weeds are destroyed through cultivation of annual grains; most annual weeds are smothered or eliminated by mowing when alfalfa is in production.
- Livestock manures (if available) are applied just in advance of corn, a heavy nitrogen consumer.
- All crops can be marketed either as is, or fed to livestock on-farm and be converted into value-added milk, meat or other livestock products.

### Cover Crops

As described in the section on crop rotations, including enough legumes in the sequence is difficult in most current Midwest farms due to the absence of livestock. One of the best ways to incorporate legumes is to use cover crops, either concurrently with the summer annual or as the summer crop begins to mature. Cover crops provide more than fixed nitrogen or a capacity to trap nutrients that would otherwise be subject to erosion or leaching. They can reduce

the impact of raindrops that are intercepted before striking the soil, prevent loss of soil and nutrients by reducing erosion, and increase infiltration of rain water thus reducing water loss from the immediate field environment. Addition of cover crops to the system also adds organic matter to the field which will improve soil structure and tilth, add a carbon source, and increase soil microbial activity. These ideas are summarized in a chapter by Karlen and Sharpley, a resource that includes 17 pages of references:

Reference:

D.L. Karlen and A.N. Sharpley. 1994. Management strategies for sustainable soil fertility. Ch. 3 in Sustainable Agriculture Systems, J.L. Hatfield and D.L. Karlen (editors), Lewis Publishers, Boca Raton, Florida. pp. 47-108.

One of the large challenges for Nebraska farmers and others in the western cornbelt and great plains regions is limited rainfall. A number of cover crop strategies that are possible farther east where rainfall averages more than 40 inches per year are not feasible in our region with 30 inches or less. Depending on distribution of the rain, there is often not enough for summer annual crop growth, with unpredictable and periodic drought at some point in the season. This leaves scant opportunity for growth of a cover crop, and in fact planting cover together with the principal crop could reduce yields of the latter. There is a window at the end of the season, while the summer annual crop is maturing and the leaves begin to senesce or fall, when years with adequate moisture could support cover crop growth. This is the most likely window for planting a relay cover crop species into the maturing cereal or soybean crop. A key reference is the book edited by Jim Power, a collection of chapters written by authors for a 1987 conference in Athens, Georgia:

Reference: J.F. Power, editor. 1987. The role of legumes in conservation tillage systems. Soil Conservation Society of America, Proc. Natl. Conf., Univ. Georgia, Athens, GA. April 27-29.

## **Compost and Manures**

Obviously animal and green manures and compost are central to organic crop production, but there are specific rules that apply to the preparation of these composts, as outlined above. For example, raw manure cannot be applied to land without composting unless this is for a crop not intended for direct human consumption. Animal manure must be composted unless it is applied and incorporated into the soil no less than 90 days before harvest of a product whose edible part of the plant is not in contact with the soil, or no less than 120 days if the product is in contact with the soil. The guidelines for composting as listed in the regulations recommend that the process achieve:

- An initial C:N ratio between 25:1 and 40:1 for best nutrient use;
- A temperature between 131 and 170 degrees F for 3 days in a contained vessel; or

- The same temperature for 15 days in a windrow system with at least five turnings.

Direct application of fresh manure and immediate incorporation is the best way to get the maximum amount of nutrients back to the field production environment. Often this is not convenient to the farming schedule, requires timely labor that is not available, or there are not fields open to receive the manure. Composting is an excellent way to stabilize the nutrients and reduce water content to ease transport and handling. When manure is left in pile (stockpiling) there is a loss of around 50% of the N due to volatilization, and there are likely to be excessive odors and fly problems associated with the storage area as well as where this is applied. Somewhat less N is lost during the composting process, especially if some additional carbon sources such as wood chips or sawdust or discard hay are added to the compost windrow. The compost should be turned regularly to speed the process, assure that weed seed and plant pathogens are killed throughout the compost mass, and mix the materials more thoroughly to attain a more uniform product. There has been a substantial amount of research on composting and the long-term effects of the application of compost on crop growth, as well as the value of compost in terms of nutrients. Some general references on composting include:

Available:

<http://www.hdra.org.uk/research/irescomp.htm> [organic composting from U.K.]

<http://www.pakissan.com/english/issues/composting.shtml> [from Pakistan]

<http://www.agf.gov.bc.ca/resmgmt/publist/300series/382500-15.pdf> [from British Columbia]

## **Systems Design**

Attention to design of the whole system is important to maintaining soil fertility in organic systems. The design of a rotation sequence of crops should include consideration of soil nutrients as well as crop protection against pests (weeds, insects, pathogens) and suitability of individual fields for specific crops. One principle of sustainable agriculture and also of organic farming is location specificity, or designing cropping systems and practices that are unique to time and place and not homogeneous over a large area for convenience of maximum economic efficiency. This often means working with smaller rather than larger fields, very timely field operations compared to long-term scheduling of many locations for efficiency of equipment transportation, and increased labor and management costs because of the need to fine-tune field activities in response to weather and to specific conditions in each field.

## References and Resources

This Extension Bulletin from Michigan State University is part of their series on ecological approaches to agriculture, and is highly recommended as a general reference on sound and sustainable management techniques and systems. They have additional bulletins on integrated pest management, ecological production of fruit crops, and other related topics that have relevance to organic agriculture. The first general bulletin is:

Cavigelli, M.A. et al (editors). 1998. Michigan Field Crop Ecology: Managing Biological Processes for Productivity and Environmental Quality. Michigan State Univ. Ext. Bull. E-2646. 92 pp. [available from MSU Cooperative Extension, \$12

Web site for MSU Publications:

<http://web2.msue.msu.edu/bulletins/subjectsearch.cfm>

Several references taken from the U.C. Santa Cruz training handbook on organic farming and gardening are copied here for convenience. There are immense numbers of materials on the web and in libraries on organic management of crop nutrients, and it is easy to find resources:

Chaney, D.E., L.E. Drinkwater, and S. Pettygrove. 1992. Organic soil amendments and fertilizers. U.C. SAREP, Publ. 21505. U.C. Davis.

Coleman, E. 1995. The new organic grower: a mater's manual of tools and techniques for the home and market gardener. Chelsea Green Publ, White River Junction, VT.

Magdoff, F., and H. Van Es. 2000. Building soils for better crops, Second edition. Sustainable Agr. Network, Handbook Series No. 4. National Agr. Library, Beltsville, MD.

Van Horn, M. 1995. Compost production and utilization: a growers guide. U.C. Division of Agr. & Natural Res. Publ. 21514, U.C. Davis.

## Useful Websites

NRSC web site related to organic farming, with many references to crop rotation and other practices related to soil fertility and pest management:

Available: [http://soils.usda.gov/sqi/soil\\_quality/land\\_management/organic.html](http://soils.usda.gov/sqi/soil_quality/land_management/organic.html)

Ontario Ministry of Agriculture and Food has a web site related to organic farming practices and systems, and another general site for information on soil fertility:

Available: [http://soils.usda.gov/sqi/soil\\_quality/land\\_management/organic.html](http://soils.usda.gov/sqi/soil_quality/land_management/organic.html)

The ATTRA web site is useful for information on organic nutrient supplies and how to design systems for maintaining soil fertility.

Available: <http://attra.ncat.org/organic.html/>

The U.C. Santa Cruz binder on “Teaching Organic Farming and Gardening” has a comprehensive treatment of soil fertility and multiple references that are useful.

Available: <http://zzyx.ucsc.edu/casfs/training/manual/index.html>

## Plant Protection and Crop Management

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The organic producer may use a variety of approaches in dealing with pest management. Management practices will be farm specific and vary from season to season and also depend on crop type and weather variations. Non-chemical management of pests begins with a good understanding of the philosophies and legalities of various management strategies. Implementing these management strategies are key to producing clean fields and good harvests while promoting soil health, and water quality while promoting beneficial insects.

The ATTRA web site ([www.attra.org](http://www.attra.org)) has a useful summary of challenges we face in agriculture. Many pest challenges are a direct result of constant application of pesticides. Thoughtful reflection on this data compels us to seek alternatives.

### Block on the Pesticide Treadmill

**Resistance:** Pesticide use exerts a powerful selection pressure for changing the genetic make-up of a pest population. Naturally resistant individuals in a pest population are able to survive pesticide treatments. The survivors pass on the resistance trait to their offspring. The result is a much higher percentage of the pest population resistant to a pesticide. In the last decade, the number of weed species known to be resistant to herbicides rose from 48 to 270, and the number of plant pathogens resistant to fungicides grew from 100 to 150. Resistance to insecticides is so common — more than 500 species — that nobody is really keeping score.

**Resurgence:** Pesticides often kill off natural enemies along with the pest. With their natural enemies eliminated, there is little to prevent recovered pest populations from exploding to higher, more damaging numbers than existed before pesticides were applied. Additional chemical pesticide treatments only repeat this cycle.

**Secondary Pests:** Some potential pests that are normally kept under good control by natural enemies become actual pests after their natural enemies are destroyed by pesticides. Mite outbreaks after pesticide applications are a classic example.

**Residues:** Only a minute portion of any pesticide application contacts the target organism. The remainder may degrade harmlessly, but too often water, wind, and soil will carry pesticides to non-target areas and organisms, affecting the health of human and wildlife populations. Public concerns over residues are deepened by the lack of research and knowledge about possible synergistic interactions between pesticide residues and the hundreds of other synthetic chemical residues now found in the environment.

<http://www.attra.org/attra-pub/ipm.html>

## Management Strategies and Resources

Specifics on insect, weed, and disease management can be found in Subpart C, “Organic Production and Handling Requirements”, of the National Organic Program (NOP) Final Rule

### Weed Management

A weed is simply a plant, growing out of place, that takes advantage of field resources unused by the crop. Weeds can become burdensome to field crops as they compete for water, soil nutrients and sunlight. Some weeds can also be toxic to livestock while also acting as hosts for pests. If weeds are not properly managed they can reduce crop yield and set seed that will increase future weed problems. Central components of organic weed control are crop rotation, tillage, mulching, livestock grazing, plant spacing and mechanical weed control. (The guidelines laid down for weed management are in section 205.206 of the NOP Final Rule.) In practice, various weed management strategies will allow the farmer to develop angles of management that are farm, field, and even crop specific, non-chemical weed control will also help to reduce the 240 million pounds of herbicides applied each year in the Midwest. (*Iowa State University, Weed Management for organic farmers, PM 1883 August 2003*).

- Crop Rotation-

Crops tend to promote weeds with a similar life cycle. It is useful to alternate crops with different life cycles and periods of growth in the field, for example sod-based crops such as alfalfa or pasture, with small grains such as wheat, oats, rye, with row-based crops such as corn, milo, soybeans. By mixing these types of rotations any one weed will have trouble establishing itself year after year because of the varied effects of weed canopies, weeds spacing, and weed suppression properties that the rotating crops exhibit.

- Tillage-

Frequent tillage is the most common practice for weed management in organic systems. Often farmers plant organic crops later than normal in order to perform one or two light tillage operations to kill the first flushes of summer annual weeds before planting. The rotary hoe is a good friend of organic farmers, and it is common to use this implement once or twice on summer annuals – just before the crop emerges and when the crop is 4-8 days old. Field cultivation of row crops is used to hill up the crop, killing weeds within the row and covering weeds within the row. For winter small grains, some European farmers use a light spring-tooth harrow in early spring to kill small emerging weeds; this is not a common practice in the U.S., but could be an option to explore.

- Mulching-

This practice is used by most organic farmers today and spreading large amounts of straw, old hay, wood chips, etc. on bare soil and among crops. Mulch regulates soil moisture and temperature as well as suppresses weeds and in some instances returns organic material back to the soil. Plastic mulches are also permitted by NOP standards but often are considered a high-input practice as they are managed through drip irrigation, soluble organic fertilization and seasonal removal. There is also the problem of disposing of plastic mulch after the season.

- Livestock

Grazing animals can disperse seeds by walking through a crop field but are more likely to deposit them in their manure. For example manure from 17 of 20 New York dairy farms averaged 45 weed seeds per pound- 90,800 seeds per ton of manure. (*Mt. Pleasant and Schlather. 1994. Weed Technology 8:304-310*) Weed seed germination will decrease after digestion and storage, and a well managed schedule of grazing locations and rotations can greatly reduce the amount of weed seed transferred by manure to crop fields.

- Row spacing and crop density-

Closer row spacing leads to greater competition with weeds growing within the crop rows as well as between, by quickly establishing a leaf canopy and increasing competition for available sunlight. High seed germination rates are also critical in developing an early competitive canopy. Planting when the soils are adequately warmed will assist in quick germination.

- Propane Flame Burning-

Flame weeding, also called flame cultivation, employs the use of propane gas burners to control weeds. Flames are directed at established weeds that are seared by the heat, disrupting the plant leaf causing it to wilt and die. Propane flame burners (LP) can be used to control weeds between and within rows. For more information see- <http://attra.ncat.org/attra-pub/PDF/flameweedveg.pdf>

## **Insect Management**

The number of insect species is greater than the number of all other species of known organisms combined. Unchecked growth of insect populations may lead to reductions in crop vigor, size, visual aesthetics and overall yield. It is clear that much more attention has been given to insects as “pests” than warranted by the evidence. Many species of native bees and flies pollinate crops, a process essential for some fruit formation and seed yield. Beneficial

insects may also serve to effectively suppress the development of harmful pest populations. Organic growers require a “whole system approach”- replacing external chemical inputs with an understanding of how biological resources on the farm can be utilized and encouraged to promote insect suppression.

- Bug Vacuums

Field vacuuming in organic farming has been developed as an alternative tool for managing insects. Vacuum machinery prevents pest damage by sucking insects from growing crops and “battering” them to death. Peaking in the late 80’s and early 90’s, vacuuming is not often seen in today’s fields yet offers an innovative approach to insect management without pesticides. For more information see

<http://www.attra.org/attra-pub/PDF/bugvacuums.pdf>

- Integrated Pest Management (IPM)-

IPM integrates a combination of techniques that monitor and evaluate populations of pests and beneficial organisms on the farm. It encourages a variety of management practices but also seeks to ensure that not any one practice is in conflict with another. IMP seeks ecological and economic solutions to reduce chemical input costs, reduce on farm and off farm environmental impacts and promote sustainable pest management. A consideration of all possible pest management strategies is sought before any action is taken. For more information see

<http://attra.ncat.org/attra-pub/PDF/ipm.pdf>

<http://www.ipmnet.org/>

## **Disease Management**

Plant diseases are caused by a diverse group of pathogenic organisms. Disease pathogens include viruses, bacteria and fungus, all of which exhibit very different biological characteristics but share similar disease development traits. Soil pathogens have a limited area of dispersal, attacking a susceptible plant’s roots that are dispersed towards the pathogen. Foliar pathogens range widely across North America dispersing by spores and effecting plant leaves. As in other pest management practices crop rotation, tillage, row spacing, cover crops, and planting date are effective strategies in containing the damages of pathogens.

## Additional Resources

### Print Resources:

Pickett, Charles H., and Robert Buggs, eds. 1998. Enhancing Biological Control: Habitat Management to Promote Natural Enemies of Agricultural Pests. Berkeley: University of California Press.

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Gips, Terry. Breaking the Pesticide Habit- Alternatives to 12 Hazardous Pesticides. International Alliance for Sustainable Agriculture. 1987

Michigan State University Extension Bulletin E-2704. Michigan Field Crop Pest Ecology and Management. January 2000.

Ellis, Barbara and Fern Bradley. "The Organic Gardener's Handbook of Natural Insect and Disease Control". Rodale Press, Inc. 1992.

### Web sources

UC Integrated Pest Management Program  
[www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu)

This bulletin by the Sustainable Agricultural Network outline how to apply ecological principals to control pests on your farm.  
<http://www.sare.org/publications/farmpest/farmpest.pdf>

National Sustainable Agricultural Information Service (ATTRA)

Site offers specific PDF or HTML publications for disease, insect, and weed management.

<http://www.attra.org/pest.html>

University of California Agriculture and Natural Resources IPM Program. The website is dedicated to addressing individual crop, disease, and insect problems through IPM guidelines.

<http://www.ipm.ucdavis.edu/PMG/crops-agriculture.html>

The Association of Applied IPM Ecologists was established in 1967 to exchange philosophical ideas and technical information. Provides good introduction of organization as well as and extensive base of IMP Agricultural links.

<http://www.aaie.net>

## Organic Livestock Production

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Information on certification for organic livestock production is presented in detail in both the NOP and the OCIA standards that are included as appendices in the handbook. The standards for organic livestock production provide guidelines for making management decisions and to assure appropriate living conditions for livestock that will limit stress and promote good health. These are good guidelines for successful production of livestock in any system, as low stress and good health lead to profitable production systems. The standards also include what substances can and cannot be used in feeding and in health care, and the guidelines for space and conditions in housing livestock.

With the recent events in the U.K., Canada, and the U.S. surrounding “Mad Cow” disease, there has been surging interest in organic meat production, especially in the EU. There is currently a push to institute a tracking system in the U.S. with more stringent rules on labeling meat and other products by country of origin similar to the system used in the EU. These events provide a market opportunity for organic farmers.

In the NOP, “livestock includes cattle, sheep, goats, swine, poultry, fish, wild or domesticated game and horses raised for slaughter or used as draft animals. There are even standards for organic bee-keeping. Regardless of whether they're raised as breeding stock, as dairy animals, or for slaughter, all livestock is covered by the NOP.” Some of the questions that come up most frequently regard feeding and feedstuffs, health care and housing, and record keeping to be able to meet certification standards.

### Feeding Organic Livestock

A substantial body of information has been accumulated on livestock feeding, especially in pasture-based systems. Early experimental results on grass feeding in Tifton, Georgia showed substantial advantages in both costs per pound of gain and in nutritional value of beef, as reported in *Organic Farming: Yesterday's and Tomorrow's Agriculture* (Wolf, 1977). The Georgia data showed a return to capital, land, labor, and management of \$9.66/head for calves and - \$18.63/head for yearlings on concentrate diet, and a return per head of \$59.13 for calves and \$23.97 for yearlings on an all-forage diet.

One of the people who has popularized grazing systems as well as careful management of grazing lands is Alan Savory with his books and educational programs related to Holistic Management (Savory, 1990). A popular speaker on

the farm circuit for several years has been Joel Salatin, Virginia farmer and author of several practical field guides to farming and marketing: *Pastured Poultry Profits* (1993), *Salad Bar Beef* (1995), and *You Can Farm: The Entrepreneur's Guide to Start and Succeed in a Farming Enterprise* (1998). His enthusiasm and common sense approach to farming and direct marketing are contagious, and his books contain many practices that are highly appropriate for organic livestock production.

Summarized briefly, organic livestock must be fed organic feed except under very unusual circumstances such as a national, state or local weather emergency or a fire or flood on an organic farm. Among the **allowed** (acceptable) **materials** are: feed raised by organic production practices, natural vitamin and mineral supplements, and fresh water from sources where contamination is unlikely.

**Materials** that are **restricted** include: conventional feeds (up to 40% allowed in animals raised for slaughter, but none is allowed within 90 days of slaughter or not within 30 days of milking or laying); antibiotics (some allowed for treatment of specific diseases, but not within 90 days of slaughter or 30 days of milking or laying); holistic veterinary medicines and practices (check regulations for allowable homeopathics, radionics, herbal preparations, and acupuncture); and vaccination (not within 90 days of slaughter or 30 days of milking or laying).

**Prohibited materials** include synthetic hormones or urea; plastic pellets for roughage; routine administration of medications not in connection with treatment of a specific malady or disease; and synthetic pesticides or fertilizers. If there is any doubt about use of specific products, farmers should consult the latest regulations of the NOP or their certifying agency – these materials are all on line.

The National Organic Standards Board (NOSB) recommends that conventional feed be allowed only if the organic feed supply has been compromised by a national, state or local weather emergency, or by fire or flood on an organic farm. Again, if there are any doubts about what is acceptable as an organic practice the farmer is urged to contact the certifying organization before making a decision to make sure that a practice is in line with the requirements.

Growth promoters and hormones, and plastic pellets for roughage in feed are prohibited. Synthetic vitamins and minerals are allowed. See The National List for more details. For use of any inputs, if there is doubt, farmers should call the certifying organization after checking carefully in the NOP or the guidelines of the specific group doing the certification.

## **Housing and Health Care for Organic Livestock**

Healthy living conditions and attentive care are considered first steps in the prevention of illness. Therefore, animals must not be overcrowded, and must

be allowed periodic access to the outdoors and direct sunlight. Antibiotics, wormers and other medications may not be used routinely as preventative measures. See [The National List](#) for specific details on medications recommended by the NOSB for use in organic livestock health care. Here are some of the details from the NOP (Paragraph 205.239):

- Livestock must have access to the outdoors, shade, shelter, exercise areas, fresh air, and direct sunlight suitable for the species, and its stage of production and the climate;
- Access to pasture for ruminants;
- Appropriate clean, dry bedding – if the bedding is typically consumed by the animals, it must comply with the feed requirements (described above);
- Shelter designed for natural maintenance, comfort and opportunity to exercise; temperature level and air circulation/ventilation; and reduction of potential for injury;
- Temporary confinement is allowed because of inclement weather, animal's stage of production, conditions where health and safety of animals could be jeopardized, and risk to soil or water quality;
- Manure must be managed in ways that do not contaminate crops, soil or water by plant nutrients, heavy metals, or pathogenic organisms; also management should include maximum recycling of nutrients.

Needless to say, most of these requirements are common sense issues regarding the safe and healthy treatment and management of livestock. They also lead to good productivity.

## **Record Keeping for Organic Livestock**

Records must be kept on all feeding and health care practices for each animal or flock, and there must be a verifiable audit trail to trace any animal or flock back to the farm. This includes where all animals were acquired, and some records on the conditions of the farm where animals were born and how they were raised. There are specific requirements for different livestock species, and examples of some of these are provided here (NOP paragraph 205.236). In general, a paper trail must be kept with all details to show compliance with these requirements:

- Poultry or poultry products must be from animals that have been under continuous organic management beginning no later than the second day of life;
- Milk or milk products must be from animals that have been under continuous organic management beginning no later than one year prior to production of milk; there are some exceptions when the entire herd is being converted;

- Breeder stock can be brought into an organic operation at any time, provided such animals are gestating and the offspring are to be raised as organic, and the mothers must be brought in no later than the last third of gestation;
- Any livestock removed from the organic operation may not be sold or labeled as organically produced;
- Breeder or dairy stock not under continuous organic management since the last third of gestation cannot be sold or labeled as organic;
- Producer must maintain adequate records to preserve the identity of all organically managed animals and edible and non-edible animal products produced in the operation.

These regulation on feeding, health, and record keeping are described in much greater details in the regulations of the NOP (included here as a appendix in the handbook) or in the specific materials provided by each certification organization. They should be kept handy as a ready reference to answer any questions that come up while making management decisions in organic livestock production operations. Some examples of additional available references and useful web sites are provided here. This is not an exhaustive list, but it is meant to serve as an entry into the considerable literature on organic livestock production.

### Print References and Resources

- Salatin, J.** 1993. *Pastured Poultry Profits*. Polyface, Inc. Swope, Virginia.  
**Salatin, J.** 1995. *Salad Bar Beef*. Polyface, Inc. Swope, Virginia.  
**Salatin, J.** 1998. *You Can Farm: the Entrepreneur's Guide to Start and Succeed in a Farming Enterprise*. Polyface, Inc. Swope, Virginia.

At a recent workshop in South Dakota, Joel Salatin was asked how many families could potentially earn their livings on his 93-acre farm in Virginia, where the farm now supports four families. Without missing a beat, Joel said "We have calculated that – the number is 24 families." Here are books by a hard-working and visionary farmer, a person who not only can succeed as a small-scale entrepreneur but can articulate that message in writing and on the speaker's podium. We recommend that you attend one of his presentations, or at the very least read one of these books.

Available:

**Wolf, R. (editor) 1977. *Organic Farming: Yesterday's and Tomorrow's Agriculture*. Rodale Press, Emmaus, Pennsylvania.**

Much of the information is taken from the *Organic Gardening and Farming* magazine published by Rodale Press, and the author cites the editors of the magazine as among the important contributors. The book is an early summary of

cultural practices for good soil fertility and organic pest protection, but also includes management issues such as manure use and rotations, and evaluation of the economics of organic farming.

Available:

<http://www.rodalestore.com/webapp/wcs/stores/servlet/CatalogSearchResultView>

## Useful Websites

**Recent Growth Patterns in the U.S. Organic Foods Market**, by Carolyn Dimitri and Catherine Greene, ERS Agriculture Information Bulletin No. AIB777. 42 pp, September 2002

This web site has a 42-page summary of the current situation on organic foods and markets in the U.S. Included are two sections on organic livestock production and marketing: *Organic Dairy Products* (p. 16-17) and *Organic Meat, Poultry, and Eggs* (p. 18-19). These sections are copied and included in this part of the handbook for quick reference.

Available: <http://www.ers.usda.gov/publications/aib777/>

**Pastured Products Directory for Nebraska.** Sponsored by “Eat Wild”, the Clearinghouse for Information about Pasture-Based Farming.

The Nebraska section is one part of this national resource on where to find pasture-based livestock, including beef, sheep, buffalo, poultry, and wild game. Although not all farms are certified organic, the operations listed provide some excellent ideas on creative marketing strategies and how to add value to livestock products. Another part of this web site has a comprehensive list of nutrition-related scientific references that can lead the interested reader into details on fat and vitamin content, human health, environmental impacts, antibiotics, and worker health in confinement versus pasture-based systems. Both sections are included here.

Available: <http://www.eatwild.com/products/nebraska.html>

Available: <http://www.eatwild.com/references.html>

**Livestock - Dairy, Meat and Poultry Production.** A Canadian website called “Cyber Help for Organic Farmers: a Rural Capacity Building through Organic Agriculture Project.”

This site contains a long list of hot links to other web sites on organic livestock production, including organic rules, beef and dairy, swine, goats and sheep, poultry including eggs, and bison. There are further links on pasture management, animal health and welfare, and marketing livestock products. This one is worth a visit, and along with ATTRA could be the best place for “one-stop shopping” of relevant web sites on organic livestock.

Available: <http://www.certifiedorganic.bc.ca/rcbtoa/training/livestock.htm>

**ATTRA Web Site.** National Sustainable Agriculture Information Service.

One of the most popular and informative web sites for organic and sustainable agriculture in the U.S., the ATTRA information resource service from Fayetteville has been attractive to small farmers for years. Their site contains regulations on certification, field crops and livestock, fruits and vegetables, herbs and flowers, pest and nutrition management, and marketing among other topics. The ease of accessibility and people ready to answer specific information requests have long

made the ATTRA resource one of the premier sites for agricultural transitions and opportunities.

Available: <http://attra.ncat.org/organic.html>

## **Pastured Products Directory**

**[<http://www.eatwild.com/products/nebraska.html>]**

### **Nebraska**

**Blue J Acres** is a 360-acre farm consisting of natural running streams, cottonwood trees and sloping hills — "a perfect place to raise our four children. We want to preserve the land and all its promises for the next generation of Jeppesen farmers."

Everything at Blue J Acres is grown without antibiotics, hormones, or pesticides. "Any animal requiring antibiotic treatment is tagged and sold at the local sale barn." All the animals are raised on a grass-based diet. The beef is raised in two different ways. One group is grassfed exclusively from birth until market. The other is grassfed to approximately 750 pounds and is then grazed on standing green corn until finished.

Beef and goat (chevon) are available from October to November. Pastured pork is sold from August to November. Pastured broilers are offered from May to November. Turkeys are sold in November. Eggs from pastured hens are sold year round. All products are available at the farm. The eggs are also available at the Farmer's Market in Blair, Nebraska.

Blue J Acres, Rolie Jeppesen, 2943 CR Y, Decatur NE 68020. (402) 349-5135.

E-mail: [vjeppesen@genesisnet.net](mailto:vjeppesen@genesisnet.net)

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**Canaan Farms** provides grassfed beef, lamb, pastured poultry, and eggs from pastured hens. "We raise Limousin and Limousin-cross beef. In our own tests, these have proven to be a little more tender and leaner than other breeds. Our animals are allowed to reach maturity before fattening, which insures the most tender beef possible. We time the fattening process so that the cattle are finished in the fall when the grass imparts its best flavor."

Our grass-fattened lambs are suffolk and suffolk-crosses. These yield well and make a tasty addition to our healthy meats menu.

Our meats can be shipped via America West Airlines, UPS and Fed-Ex. Shipping costs are extra and are figured on an order-by-order basis.

We think you will find our prices very reasonable and invite you to contact us for a brochure and a current price list.

Canaan Farms, Dale and Laura Hipps, 1705 CR 1, Lyons, Nebraska 68038. (402) 687-2582.

E-mail: [canaanfarm@huntel.net](mailto:canaanfarm@huntel.net)

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**Clover Cove Ranch** has over 1,300 acres of certified organic prairie grasses and sub-irrigated meadow land located on the rim of Nebraska's sand hills. Our ranch and livestock are MOSA certified and no conventional fertilizers have been used for over twenty years.

Meat from grass-fed bison and beef is available year-round. Pastured eggs and dairy products can be picked up at the ranch. We milk 20–30 certified organic, grass-fed cows year-round and strive for high CLA and nutrient dense milk content. From December through

March the dairy cows are fed two pounds certified organic soy flakes for energy during the cold weather.

Clover Cove Ranch, Jerry Gotschall, 86389 468th Avenue, Atkinson NE 68713. (402) 925-2431.

E-mail: [jkgothschall@elkhorn.net](mailto:jkgothschall@elkhorn.net) Website: <http://www.clovercove.com>

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**The Grain Place, Inc.** offers beef from animals that have been raised exclusively on pasture or have been finished on grain for 30, 60 or 90 days. You get to choose. All orders must be placed by June 15th. The meat is available in split halves, halves, or whole beef. (The Grain Place is also a supplier of organic grains.)

The Grain Place, Inc. Michael R. Herman, 1904 N Highway 14, Marquette NE 68854. (402) 854-3195. E-mail: [mrherman@hamilton.net](mailto:mrherman@hamilton.net)

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**McRobert's Game Farm** is one of the few grass farms in the United States that specializes in game animals. Yak, elk, bison, deer, Yak/beef crosses, and llamas are available as breeding stock. Meat is also available for sale. Yak meat is very lean and low in saturated fat. The animals are very thrifty and put on weight more easily than many other grazing animals, making them economical to raise for market.

McRobert's Game Farm, Jerry McRoberts, 55 Yak Trak, Gurley NE 69141. (308) 884-2371; fax: (308) 884-2337. E-mail: [jbmicrob@daltontel.net](mailto:jbmicrob@daltontel.net) Website: [www.mcrobertsgamefarm.com](http://www.mcrobertsgamefarm.com)

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**Nebraska Natural Meats** is a cooperative of eight farmers from northeast Nebraska who work together to provide a year-round supply of hormone-free, naturally-fed beef, chicken, duck, pork, and buffalo.

Our beef and buffalo meats are naturally lean because the animals are raised on a high-protein grass diet, and they get plenty of exercise while grazing. Some of the cattle are finished on a small amount of grain and all the buffalo are raised on grass only. You can request grass-only beef if that is your preference. Meat from animals raised on organically certified pasture is also available.

Buffalo (bison), beef and pork are available year round. Lamb and poultry are sold in season only. The beef and pork are available in whole, half or split half carcasses. Once your order is placed, the animal will be delivered to an agreed upon processing facility and your meat will be cut and wrapped to your specifications. All of the meat is handled in accordance with state and federal regulations. Prices are competitive with grocery store prices.

Nebraska Natural Meats, contact person: Betty Henzler, Route 1, Box 180, Pierce NE 68767.  
(402) 329-4277.

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**The Perfect "10" Buffalo Ranch** has 5,000 acres of certified organic prairie grasses sustaining a herd of 800 grass-finished bison. The ranch is large enough to allow the bison to roam at will on native prairie grasses, and the herd size is sufficient to recreate the natural social order of the animals. The end result is a low stress, healthy environment similar to the open plains of hundreds of years ago.

The Hutchinsons offer their "Tatonka Gourmet Bison" in quarters, halves, and whole animals. Individual cuts, 20# packages, and summer sausage are available as well. The meat is sold in Lincoln, Nebraska at the Ideal Grocery, Aikin's Health Food Store, and Open Harvest. (The meat is distributed to other retail stores throughout the area by Pegler-Sysco Distributors.) The meat can be shipped UPS anywhere in the United States. New: bison jerky in five different varieties is now available for sale as well!

Perfect "10" Buffalo Ranch, Dave Hutchinson, HC 75 Box 146, Rose NE 68772. (402) 273-4574.

E-mail: [buffalo@nntc.net](mailto:buffalo@nntc.net) Website: <http://www.organic-buffalo.com>

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**Prairie Rose Ranch** offers grass-fed beef, lamb, poultry, eggs, and dairy products. Our products may be picked up year-round at our farm store or delivered on our CSA/Egg delivery routes. Shipping is available.

We *never* feed animal by-products, antibiotics, or hormones. We are working toward organic certification. Our beef is currently Irish Dexter steers, giving us tasty petite cuts. In 2002, we will offer petite cuts from our new Lowline cattle and standard cuts from our Hereford cattle. Either way, you'll find us a cut above the rest. We offer whole, half, split-half, USDA-inspected packages as well as individual cuts.

Our lamb is available from lambs raised strictly on mother's milk and grass. Available in whole, half or USDA-inspected individual cuts. Chickens and turkeys are pasture-raised. Raw milk and eggs are available year round. Our Jersey cows are supplemented with a small amount of grain. Additionally, we offer tours, field days (such as our annual Shearing Day), cooking and herbal classes, plus our on-farm bulk food store.

Prairie Rose Ranch, Friend, NE (402) 947-6221 E-mail: [prairieroseranch@alltel.net](mailto:prairieroseranch@alltel.net)  
Website: <http://www.prairieroseranch.com>

**Sandhills Red Angus.** Our goal is to provide high quality grassfed beef to people who are concerned about the quality, safety and nutrient content of their food.

No Steroids. No Antibiotics. No Stress. Lean, juicy, tender, flavorful beef that you just can't buy in a store.

Sandhills Red Angus, Derek and Lesa Schwanebeck, Box 7, Ellsworth NE 69340. (308) 762-5767.

E-mail: [swany@premaonline.com](mailto:swany@premaonline.com) Website: <http://www.sandhillsredangus.com>

**Tar Box Hollow Buffalo Ranch** raises bison naturally on grass. The grass-finished bison meat is available at the ranch in quantity.

Tours are available Wednesday through Saturday from May 1st through September.

Tar Box Hollow Buffalo Ranch, Rose Mason, 57957 871St Rd., Dixon NE 68732. (402) 584-2337. Website: <http://tarboxbuffalo.com>

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**The Tucker Hill Farm** offers grass-finished lamb and beef as well as pork and eggs. The grass-finished lamb is available in 1/2 lamb bundles in the summer and fall. The lambs are fed fresh grass and hay only. Pastured chickens, raised the "Joel Salatin way," are available from June through October, fresh dressed from the farm. Custom processed pork, half or whole carcass, is available in October.

All meat products can be shipped UPS or picked up at the local processor or the farm. Brown, fertile eggs can be picked up at the farm or delivered locally.

We direct market our products. Place your orders with us, and we arrange for custom processing just the way you want it! We are pasture-based and manage our animals with the intensive rotation system. We do not use drugs on any of our animals. We are open for visits. Please call or write first.

Tucker Hill Farm, Bev and Chuck Henkel, 1614 N. 61st., Norfolk NE 68701. (402) 371-5787. E-mail: [bchenkel@conpoint.com](mailto:bchenkel@conpoint.com)

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From our **Walnut Creek Organic Ranch** in South Central Nebraska to your table, we are committed to producing humanely raised animals in an environmentally friendly, stress-free atmosphere that promotes good health and supports a sustainable food system in the balance of nature. Our family owned ranch is FVO Farm certified organic and has been chemical free for thirteen years. We have designed a grazing system to simulate conditions during the time of the buffalo that roamed here for centuries.

Our grass-fed Angus beef have been genetically selected for their natural health, excellent mothering ability, and the tenderness of their meat. They are born, raised and finished on tall, lush, native Nebraska prairie grasses, and natural occurring herbs and legumes. They are free to socialize and enjoy our country fresh air and mineral-rich, deep well water.

Our CLA and omega-3 rich USDA inspected, hormone and antibiotic free, grass-fed Angus beef will be ready by the whole, halves, split halves, or special packs for shipment throughout the USA this fall. We are happy to help you design a variety of cuts for your specifications. Order early to assure availability. Please visit our website for more information.

Walnut Creek Organic Ranch. (402) 262-2245. E-mail: [walnutcreekranch@alltel.net](mailto:walnutcreekranch@alltel.net)  
Website: <http://www.walnutcreekororganicranch.com>

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**Waucapona Farms** raise their cattle under management intensive grazing practices for healthy livestock and a clean environment. The grassfed beef is slaughtered off the grass in October or November. Grain-fed beef is available from cattle that are finished by grazing standing corn. All the meat is free of antibiotics, hormones, and animal by-products. Every effort is made to minimize stress on the animals from birth until slaughter.

The dry-aged beef is available in wholes, halves and split halves. Grassfed meat is available in October and November. Grain-fed is available December through June.

Waucapona Farms, Marvin DeBlauw, 88625 568th Ave, Hartington NE 68739. (402) 254-3429.

**Scientific References** [from <http://www.eatwild.com/references.html>]

This section of the website features journal references relevant to grass-based production. We have sorted them into categories and highlighted some of the most significant studies.

- Fats in products from pasture-raised and confinement-raised animals
- Human health and the ratio of omega-6 to omega-3 fatty acids in the diet
- Vitamin content of products from pasture-raised and confinement-raised animals
- Environmental consequences of grass-based versus confinement-based animal production
- Animal health and welfare in grass-based and confinement-based animal production
- Questionable ingredients in feedlot diets
- Consequences of the use of feed antibiotics, steroids, and other drugs in animal production
- Worker health in animal confinement operations

*Fats in products from pasture-raised and confinement-raised animals*

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# Organic Gardening

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Organic methods are often relegated to the small-plot, garden-scale level of production. Following the Green Revolution, research in agronomy and horticulture increasingly focused on crop technologies including synthetic fertilizers, herbicides, and pesticides. As a result, inquiry into organic farming systems came to a screeching halt, and organics became associated with gardens, and not with the new large-scale monocrop agriculture. Some key individuals and institutions, however, continued work in organic systems. Currently, there is probably more information written in books and available on websites on organic gardening than has been compiled for organic farming. The vigorous magazine and book publication efforts of groups such as the Rodale Press are largely responsible for the preponderance of organic gardening information. There are numerous books available on techniques for pest management, composting, interplanting, adaptation of cultivars for different zones, and all the details on different philosophies for organic garden management. Several of these resources are provided at the end of this section.

Information on organic gardening is provided in this handbook because Cooperative Extension Educators are likely to get many questions from clients about specific pests in the organic garden, and how to manage soil fertility on a small scale at the home level. This section includes general information about rotations, mulching and cultivation, location and planting dates, and insect management. For more specific information, please refer to the *References and Resources* and *Useful Websites* listed at the end of the section. We invite your suggestions and additions to the organic gardening information.

## Rotations

The attached NebGuide by Dale Lindgren and colleagues is from 1990 [G81-548-A (Revised June 1990)]. It includes all the important principles of organic gardening and can serve as a general resource. The authors point to the importance of organization and record keeping, especially for designing rotations to avoid insect and disease problems. Because certain related crops such as tomato and peppers are susceptible to the same insects and pathogens, they should not return to the same site for three to five years. A detailed garden map made each year can help gardeners that may have difficulty remembering exactly where certain crops have been planted. The map will facilitate useful crop rotations that help reduce or avoid insect and pathogen problems that affect plants within the same plant families.

The NebGuide is available:

<http://ianrpubs.unl.edu/horticulture/g548.htm#RESISCROP>

## Mulches, Cultivation, and Composting

Weed and water management are problems in organic gardening systems just as they are in organic farming systems. Garden mulches can be used in the summer to reduce the amount of water lost through evaporation and to help control weeds. Winter mulches can also be used to help the garden retain moisture and prevent the loss of perennial plants. The Lindgren et al. NebGuide provides various sources of mulch available to the home gardener, including grass clippings, hay or straw, wood shavings or sawdust, and ground corn cobs available here in the Midwest. Many of these mulching options are well-suited to the small areas of a home garden, while they would not be feasible for a larger field area because of materials costs or the labor needed to install them. The authors point out that mulching effectiveness depends on the material and the thickness of application. They also note that while there are many benefits, the mulch can bring in weed seed, and if grass clippings come from neighbors' yards where chemicals are applied, this could compromise the organic status of the garden. Another publication about landscapes that describes mulching alternatives is available at: <http://ianrpubs.unl.edu/horticulture/g1257.htm>

Methods of cultivation and management of the garden environment can contribute to overall success. Weed management can be achieved through the use of mulches, mechanical cultivation using a tiller, manual removal, or through the use of garden implements such as hoes and other cultivators. The garden environment can be managed through careful inspection of all incoming plants and removal of all diseased or insect-infested plants. Observation of the garden is important for maintaining a weed, insect, and disease-free environment.

Composting is key to the success of organic gardens. Food scraps, weeds, plants that are removed, grass clippings, and other organic materials can be composted and later used for fertility, weed, and water management. Details on composting in the home garden are described in the Nebraska Cooperative Extension NebGuide 86-810, *Garden Compost*, which is also available at: <http://ianrpubs.unl.edu/horticulture/g810.htm>

## Location and Planting Dates

Most home gardeners are limited in the choice of sites and size of a garden, but some guidelines can help stimulate plant growth and minimize pest problems. Shaded areas will generally reduce crop growth and provide an environment for more plant diseases. The site should be well drained, and this can be improved by adding sand in an area with heavy soil or putting a gravel layer beneath the garden to enhance drainage. Obviously this is an expensive and time-consuming activity, and only applicable to small areas. Additionally, an accessible water source is important for our unpredictable climate. Drip irrigation

is preferable to sprinklers, since the latter may keep the foliage wet and more susceptible to leaf diseases and some insects.

Some pest problems can be avoided by altering planting dates. For example, a delayed planting of some vegetables can avoid the major insect infestations of early summer. Planting dates will depend on moisture availability and the temperature regime.

## **Insect Management**

The best solution to control insects is to plant resistant varieties of vegetables, although these are not always available. Row covers can be used to physically protect plants, a workable solution for the small areas generally found in home gardens. Metal screens can also be used as an exclusionary tactic on small areas to prevent larger insects as well as other pests such as rabbits. Trap crops such as nasturtium for aphids, or physical traps such as shingles laid on the ground, can attract problem insects to a place where they can be destroyed. Some insects that are of large enough size, such as the Colorado Potato Beetle, can be physically removed from plants in a small garden. Spraying plant leaves with water or a soap solution can remove and even prevent some insect problems. Biological control methods such as *Bacillus thuringiensis* (Bt), pyrethrins, rotenone, sulfur, insecticidal soaps, and nicotine sulfate can be used since they are biologically derived or acceptable for organic production. There are many home remedies, and a wide range of products offered on the commercial market. Some of these methods are effective, but common sense should be the guide in selecting such products. The home gardener should seek good references from independent sources or talk to people who have employed these methods to determine if they are effective, safe, and cost-efficient.

The following websites are useful for insect management information:

<http://anrcatalog.ucdavis.edu/pdf/7251.pdf> [California]

<http://anrcatalog.ucdavis.edu/merchant.ihtml?pid=3706&step=4> [California]

<http://www.agr.gov.sk.ca/docs/organics/research/organicinsect.asp?firstPick=Organics> [Canada]

<http://www.cals.ncsu.edu/sustainable/peet/IPM/insects/04insect.html> [North Carolina]

## References and Resources

Probably the oldest of magazines with the most comprehensive coverage of organic gardening is the magazine from Rodale Press in Emmaus, Pennsylvania. The magazine was originally called "Organic Farming and Gardening", but was split into the current magazine called simply "Organic Gardening" and "The New Farm" that was published for 15 years. The latter is again available online.

Available: <http://www.organicgardening.com/> [Organic Gardening magazine]  
<http://www.newfarm.org/> [new website for *The New Farm*]

Rodale Press also has a number of books dedicated to organic gardens and organic gardeners. Perhaps the most useful book that can be used as a quick reference is

### **Rodale's All-New Encyclopedia of Organic Gardening**

Fern Marshall Bradley and Barbara W. Ellis (eds). ©1997, Rodale Press.

## Useful Websites

The program at North Carolina State University has been especially active in management of sustainable vegetable systems, including organic gardens. Dr. Mary Peet has prepared many of these publications, and they are especially relevant to production in the Southern U.S.

Available: <http://www.cals.ncsu.edu/sustainable/peet/index.html>

The ATTRA web site mentioned in various parts of this handbook has a number of publications on organic vegetable production.

Available: <http://attra.ncat.org/organic.html>

Rutgers University, Cornell University, and University of Connecticut all have relevant information on organic vegetable production, and some of the web sites are given here:

Available: <http://aesop.rutgers.edu/~farmmgmt/ne-budgets/organic.html#veg>  
<http://www.hort.cornell.edu/>  
<http://www.canr.uconn.edu/ces/ipm/ipmveg.htm>

There is a wealth of material from across the globe, especially Europe, North America, and Australia. A small sampling of web sites is given here, representative of what is available with a little time and patience to seek sites and screen out what can be useful in a given location. These include member organizations (non-profits), educational institutions, and private companies.

*Australia*

<http://www.organicdownunder.com/>

*United Kingdom*

<http://www.organiccatalog.com/catalog/>

<http://www.organicgarden.org.uk/>

<http://www.hdra.org.uk/>

*United States*

[http://supak.com/organic\\_gardening/organic.htm](http://supak.com/organic_gardening/organic.htm)

<http://www.gardenersnet.com/organic.htm>

## Marketing Organic Products

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The marketing model used in conventional agriculture is not easily applied to organic systems. Currently, local elevators that accept organic grains are not common, though they do exist in some areas. Farmers that transition to organic production must also transition their marketing strategies. Whether growing organic grains, herbs, fruits and vegetables, or raising organically certified livestock, marketing becomes an additional consideration. Producers who have always sold to local elevators will find that quality time will be needed to do a good job with marketing organic products.

That said, marketing organic crops and products can bring high premiums, and can provide farmers with a stable customer-base and market. Local marketing, in particular, allows farmers to avoid the vagaries and fluctuations of commodity markets. When the farmer can set product prices, he or she has more control over farm profits. The farmer also establishes personal connections with consumers, as described in detail in the section on local food systems.

This section provides information about local marketing strategies of organic food crops and provides a list of organic grain buyers in Nebraska.

### Marketing Products within Local Systems

Green and Hilchey (2002) state that community-based marketing and value adding are key strategies for connecting farmers and consumers in a local system. A condensed list of specific marketing strategies is provided below. For more in depth information, references, and resources, see *Growing Home: A Guide to Reconnecting Agriculture, Food and Communities* (complete reference is provided in the following section).

- **Farmers' Markets**  
In 2000, there were 2,800 farmers' markets in the United States, and 19,000 farmers reported that these markets were their sole revenue sources for the year. Nebraska has several operational farmers' markets across the state. A 2004 Nebraska Department of Agriculture publication, *Your Guide to Nebraska Fresh Produce*, is provided in the back of this handbook. The guide includes a Producer Index and a list of communities in Nebraska with farmers' markets.
- **Community Supported Agriculture (CSA)**  
"CSA is a relationship of mutual support and commitment between a local farmer and community members who pay the farmer an annual membership fee to cover the production costs of the farm. In turn,

members receive a weekly share of the harvest during the local growing season. The arrangement guarantees a farmer financial support and enable many small to moderate- scale organic family farms to remain in business. Ultimately, CSA created ‘agriculture-supported communities,’ where members receive a wide variety of really fresh foods harvested at their peak of ripeness, flavor, and vitamin and mineral content” (Robyn Van En Center for CSA Resources, [www.csacenter.org](http://www.csacenter.org)). A NebGuide titled, *Community Supported Agriculture*, by Paul Swanson is included at the end of this section.

- **Restaurant Agriculture**  
Organic farmers can specialize in wholesaling products directly to restaurants. This strategy is particularly rewarding when marketing to chefs who seek high quality produce at high quality prices. An Iowa State University Extension publication called, *Local Food Connections: From Farms to Restaurants*, is included at the end of this section.
- **Institutional Food Services and Farm-to-School Programs**  
Schools, hospitals, nursing homes, summer camps, and prisons are potential markets for local crops. While there is often a fair amount of “red tape” associated with entering these institutions, there are several examples where the model has been successful. Two Iowa State University Extension publications, *Local Food Connections: From Farms to Schools*, and *Local Food Connections: Food Service Considerations*, are included at the end of this section.
- **Regional Identity Markets**  
This marketing strategy combines agriculture, tourism, value-adding, and direct marketing using regional place names to evoke an area’s history, culture, and landscape. Regional identity marketing is not new to Nebraska, but can be increased and used to more growers’ benefits. Product names referring to names and places such as “Husker”, “Sandhills”, “Niobrara”, and “Bohemian Alps” can be used to identify farm products. Further, adding the label “organic” to these titles adds more local value and identity to product names.
- **Connecting with Ethnic Communities**  
The United States can be described as a cultural melting pot. This country is home to many ethnic groups and accompanying cultural traditions. Food is an integral component of culture, and presents another opportunity for direct marketing of farm products. Specialty markets are increasing for a diverse array of fruits and vegetables, herbs, dairy products, and live poultry, goats, and lamb.

- **Buy-Local Campaigns**

Over \$550 million in agricultural products were sold directly to consumers in 1997, indicating a clear desire of many consumers to buy from local farmers. As a result, there are campaigns to promote buying local foods that also serve as market exposure for local farmers. The *Be a Local Hero* campaign in Pioneer Valley, Western Massachusetts is a prime example of a successful venture. Their website is full of useful information, as well as success stories from the Community Involved in Sustaining Agriculture (CISA) group. Available: <http://www.buylocalfood.com/about.html>.
- **Cooperative Farm Stores**

There is a long history in this country of farm stores carrying local foods and products. However, the success of these small operations dwindled following World War II when demand for a wide variety of products forced them to restructure as private corporations. Recently, Europeans have developed a model for local food farm stores. Some farmers in France have organized networks of cooperatively owned and operated farm stores to retail fresh local produce and products. A similar venture is currently underway here in Nebraska. The Centerville Farmers' Market in Lincoln has been operational since 2003, and is focused on marketing locally-grown and produced foods. The website is: <http://www.centervillemarket@alltel.net>.
- **Produce Auctions**

About 25 produce auctions operate in the eastern United States, and are held several times a week. Produce is graded and pre-boxed before it is brought to the auction barn. Buyers are often roadside stand or farm store operators, restaurant and grocery store representatives, and families and individuals.
- **Food Circles**

The Food Circle model was developed by the Food Circle Networking Project at the University of Missouri. A food circle is a network of food production, processing and marketing enterprises that fosters the growth of local food and agriculture systems. Activities often include organizing speakers for the community, organizing food-related community events, publishing local food information, and other community-centered educational programs.
- **Cooperative Marketing**

Many farmers have become disenchanted with the idea of co-ops because of their decline and/or consolidation with larger entities. When cooperatives become too large, they lose local relevance and control and begin to behave like large corporations. Some farmers that grow specialty crops, however, may consider co-ops again as viable marketing

strategies. There are challenges associated with co-ops, but also real economic and social benefits.

- **New Generation Cooperatives**

These co-ops are based on value-adding activities and limits to the number of farmers that can participate as stake holders. The new generation co-ops provide further opportunities for group-style marketing.

- **Marketing and Trade Clubs**

These clubs consist of small-group, farmer-to-farmer interactions, and sharing of marketing information. The Nebraska Sustainable Agriculture Society (NSAS) is an example of an organization that might include a marketing and trade club. While NSAS has much larger goals and functions, information is freely shared among farmers in the organization. The NSAS website is available: <http://www.nebsusag.org/>

## Organic Grain Buyers in Nebraska

Marketing organic grains may require marketing strategies that are different than some of those listed above. For example, it is impractical for a grain farmer to use a farmers' market or a CSA operation. In this situation, grain can be contracted for market prior to planting time, and a relationship can be forged with grain traders. In Nebraska, there are several options for organic grain producers. Following is a partial list of potential grain buyers in the state and surrounding areas.

### AgFinder

10730 Pacific, Suite 12  
Omaha, NE 68114  
(402) 391-1023  
email: [agfinder@radiks.net](mailto:agfinder@radiks.net)

### Heartland Organic

219 SW 2<sup>nd</sup>, PO Box 39  
Stuart, IA 50250  
(515) 523-1888  
email: [homc@heartlandorganic.com](mailto:homc@heartlandorganic.com)

### Integrity Mills, Inc.

616 6<sup>th</sup> Ave. W  
Cresco, IA 52136  
(319) 547-5827

### New Horizon Commodities

7723 Hwy 63  
St. Marys, KS 66536  
(785) 535-2010  
<http://www.newhorizoncommodities.com>

### Profiseed-International

1691 Hwy 65  
Hampton, IA 50441  
(800) 809-3493

### Scoular Grain

2027 Dodge Street  
Omaha, NE 68102  
(800) 488-3500  
email: [gleigtag@scoular.com](mailto:gleigtag@scoular.com)  
<http://www.scoular.com>

### Stonebridge Ltd.

3826 Cedar Heights Drive  
Cedar Falls, IA 50613  
(319) 277-4277  
email: [time@stonebridgeletd.com](mailto:time@stonebridgeletd.com)  
<http://www.stonebridgeletd.com>

### The Grain Place

1904 N. Hwy 14  
Marquette, NE 68854  
(402) 854-3195  
email: [mrherman@hamilton.net](mailto:mrherman@hamilton.net)

## References and Resources

### **Growing Home: A Guide to Reconnecting Agriculture, Food and Communities**

Joanna Green and Duncan Hilchey  
2002

Copies available: Community, Food and Agriculture Program  
Department of Rural Sociology  
Warren Hall  
Cornell University  
Ithaca, NY 14853  
(607) 255-9832  
www.cfap.org

## Useful Websites

**FoodMAP** – Food Marketing and Processing. University of Nebraska.

This is a very useful website with an easily searchable database.  
“A comprehensive clearinghouse of marketing and processing information on *identifying new markets*, learning about *alternative agriculture* opportunities, locating *processing equipment*, understanding *processing requirements* and *ingredients* and finding information on a large variety of other topics.”

Available: <http://www.foodmap.unl.edu/index.asp>

**Leopold Center for Sustainable Agriculture.** Iowa State University.

“The Leopold Center for Sustainable Agriculture explores and cultivates alternatives that secure healthier people and landscapes in Iowa and the nation.”

This website includes links to publications, news and events, newsletter articles, annual reports, and other useful information.

Available: <http://www.leopold.iastate.edu>

**Community Involved in Sustaining Agriculture (CISA).** Pioneer Valley, Western Massachusetts.

This website includes information about the “Be a Local Hero” campaign that aims to increase production of locally-grown foods. A multimedia campaign manual is available for purchase.

Available: <http://www.buylocalfood.com/about.html>

**Robyn Van En Center**

This website is for the Robyn Van En Center for CSA Resources. The site is full of useful information about CSA.

Available: <http://www.csacenter.org>

**Biodynamic Farming and Gardening Association**

CSA information is provided.

Available: <http://www.biodynamics.com/csa.html>

**Appropriate Technology Transfer for Rural Areas (ATTRA)**

ATTRA has information about marketing meats to restaurants and institutional markets.

Available: <http://www.attra.org/attra-pub/altmeat.html>.

**North American Farmers' Direct Marketing Association**

Contact: Charlie Touchette

(888) 884-9270, email: [nafdma@map.com](mailto:nafdma@map.com)

Available: <http://www.nafdma.com>

**University of Wisconsin Center for Cooperatives**

Available: <http://www.wisc.edu/uwcc>

**Community Food Security Coalition**

Available: <http://www.foodsecurity.org>

**USDA Community Food Security Initiative**

Available: [http://www.ree.usda.gov/food\\_security/foodshp.htm](http://www.ree.usda.gov/food_security/foodshp.htm)

**Centerville Farmers' Market**

Contact: John Ellis, Lincoln, Nebraska

(402) 477-2322, email: [centervillemarket@alltel.net](mailto:centervillemarket@alltel.net)

Available: <http://www.centervillemarket.com>

**Nebraska Sustainable Agriculture Society**

Available: <http://www.nebsusag.org/>

## Organic Farming and Local Food Systems: Intimate Connections

Organic farming is the focus of this handbook. The previous sections have outlined history and philosophy, certification, and specific methods for organic systems. The purpose of this chapter is to connect organic farming to local food systems and provide information about the benefits of this partnership for farmers and consumers. Organic farming and local food systems can both result in increased farm profits. The two systems are becoming increasingly connected as organic farmers often chose to market their food products through local pathways. Both can greatly benefit farmers and rural communities as food dollars are recirculated in the local economy

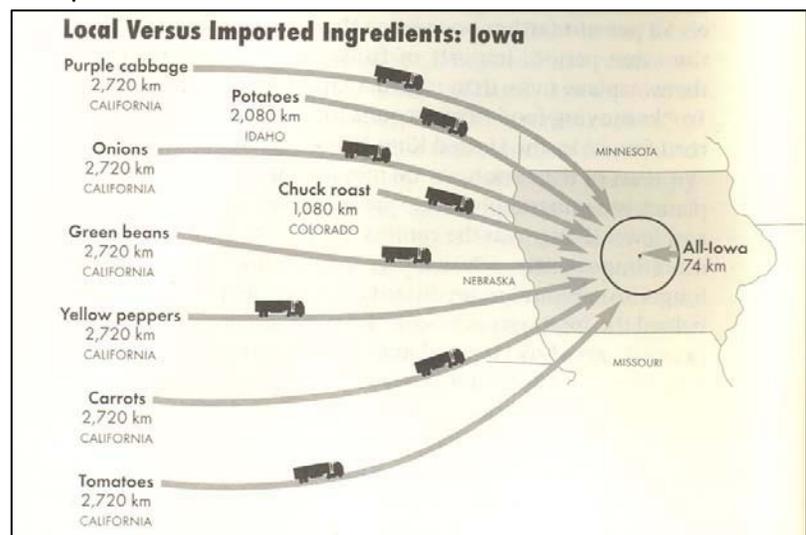
### The Conventional Global Food Chain

The food system in the United States is based on a complex global chain of production and distribution. Consumers in the U.S. spend 10.7% of their disposable income on food, and half of this food budget is now spent on fast food (Schlosser, 2000). The farm value share received by farmers is only a fraction (19%) of each consumer's food dollar (Economic Research Service, 2002) and we now pay more for packaging and advertising food than we pay farmers to produce it (Green and Hilchey, 2002). At the same time, farm production costs are increasing, further depressing farm profits.

Food in this system travels between 1,550 to 2,500 miles from farm to plate, a 25% increase since 1980 (Halweil, 2002). A recent study done by Pirog and Benjamin (2003) at the Leopold Center for Sustainable Agriculture, Iowa State University compares the transportation pathways of food traveling conventional pathways and food traveling locally (article included). Figure 1 shows that food going into an "All-Iowa" meal travels an average of 74 kilometers (46 miles), while food from the conventional system travels an average of 2,577 kilometers (1,600 miles). The authors estimate that a meal from the conventional food chain uses 4 to 17 times more petroleum and results in 5 to 17 times more carbon dioxide emissions.

**Figure 1.** Local versus imported ingredients: Iowa.

Source: Halweil, 2002



## Local Food Systems

A young local foods movement is gathering momentum as both farmers and consumers demand a better food system and an alternative to the global food chain. Farmers seek innovations to survive on the farm, and consumers are going out of their way to support local farmers (Green and Hilchey, 2002). Local food systems are not intended to replace the conventional food system; rather, they are offered as a means to diversify the global chain. Farmers who sell directly to consumers receive higher net returns, and consumers are rewarded with fresh produce that supports a local farmer and the local community as a whole. A partial list of the benefits of local organic food systems is provided in the box below. We can also add a measure of increased food security to this list, an issue of growing global importance.

### Benefits of Local Organic Food Systems

#### ● Economic Benefits ●

- Farmers receive a higher share of the consumer food dollar, especially with organic premiums.
- Farm input costs for fertilizers, herbicides, and pesticides are reduced.
- Transportation costs are reduced.
- Money is recirculated locally.
- Consumers pay farmers directly and subvert corporate control of the food system.

#### ● Environmental Benefits ●

- Fossil fuel use for transportation and carbon dioxide emissions are reduced.
- Watersheds are protected from herbicide and pesticide run-off.
- Wildlife habitat is enhanced.
- Biodiversity (crops and otherwise) increases.

#### ● Social Benefits ●

- Community connections between farmers and consumers are forged.
- Farmers are recognized as integral components of the community.
- Small- to moderate-sized farms can remain viable.
- Jobs are created both on farm and in the rural community.
- A strong middle class of independent small businesses is created and supported.
- Diversified farming communities create good environments for families.

## **Organic and Local**

Organic farming fits directly into local food systems. Consumers are looking for fresh, high quality, good tasting produce. Increasingly, many consumers state that “pesticide free” produce is also important to them (Govindasamy et al., 1997). Farmers who grow organically and market locally benefit from these customer preferences that can become market demands. Local food systems are built on relationships of mutual trust between “food growers” and “food eaters”. Organic farmers who have such relationships with their customers not only reap the benefits of organic market premiums, but can secure a customer base for years into the future. See the **Marketing** section of this notebook for specific marketing strategies.

## **References Included in this Section**

Three papers about local food systems are included in this handbook for your information and reference. The Pirog and Benjamin (2003) study compares food miles for local produce (Iowa grown) and conventional produce. It includes useful tables with food mile comparisons, and Figure 2 shows how much further conventional produce travels than local produce.

The Huber and Woldridge (2004) article is about the Local Food Brokering Project in Iowa. The authors are members of Practical Farmers of Iowa (PFI), and share information about the genesis of the project and the “All-Iowa Meal”.

Finally, the Feenstra (1997) paper fleshes out the community benefits of local food systems and offers strategies and research needs for their implementation. Several references are provided.

## References and Resources

### **Checking the Food Odometer: Comparing Food Miles for Local Versus Conventional Produce Sales to Iowa Institutions.**

Rich Pirog and Andrew Benjamin  
2003

Leopold Center for Sustainable Agriculture, Iowa State University

Article included here and also available online:

[http://www.leopold.iastate.edu/pubs/staff/files/food\\_travel072103.pdf](http://www.leopold.iastate.edu/pubs/staff/files/food_travel072103.pdf)

### **Revealing the Secrets of the All-Iowa Meal: The Local Food Brokering Project of Practical Farmers of Iowa**

Gary Huber and Andrea Woldridge  
2004

Prepared for the North Central Initiative for Small Farm Profitability

Article included here and also available online:

<http://www.foodmap.unl.edu/index.asp>

### **Home Grown: The Case for Local Food in a Global Market**

WorldWatch Paper 163

Brian Halweil  
2002

Available online: <http://www.worldwatch.org/pubs/paper/163/>

### **Growing Home: A Guide to Reconnecting Agriculture, Food and Communities**

Joanna Green and Duncan Hilchey  
2002

Copies available: Community, Food and Agriculture Program

Department of Rural Sociology

Warren Hall

Cornell University

Ithaca, NY 14853

(607) 255-9832

[www.cfap.org](http://www.cfap.org)

### **Quality of Agricultural Produce: Consumer Preferences and Perceptions**

Ramu Govindasamy, John Italia, and Clare Liptak  
1997

Rutgers University Cooperative Extension

Available online: [http://aesop.rutgers.edu/~agecon/pub/qual\\_ag.pdf](http://aesop.rutgers.edu/~agecon/pub/qual_ag.pdf)

**Local Food Systems and Sustainable Communities**

Gail W. Feenstra

1997

American Journal of Alternative Agriculture. Vol. 12, No. 1.

**Fast Food Nation: The Dark Side of the All-American Meal**

Eric Schlosser

2002

Perennial (Houghton Mifflin Company), New York, NY.

**Useful Websites****FoodMAP** – Food Marketing and Processing. University of Nebraska.

This is a very useful website with an easily searchable database.

“A comprehensive clearinghouse of marketing and processing information on **identifying new markets**, learning about **alternative agriculture** opportunities, locating **processing equipment**, understanding **processing requirements** and **ingredients** and finding information on a large variety of other topics.”

See specifically the research entitled “Attracting Consumers with Locally Grown Products” by Brad Zumwalt, Food Processing Center, University of Nebraska.

Available: <http://www.foodmap.unl.edu/index.asp>**Leopold Center for Sustainable Agriculture.** Iowa State University.

“The Leopold Center for Sustainable Agriculture explores and cultivates alternatives that secure healthier people and landscapes in Iowa and the nation.”

This website includes links to publications, news and events, newsletter articles, annual reports, and other useful information.

Available: <http://www.leopold.iastate.edu>**Community Involved in Sustaining Agriculture (CISA).** Pioneer Valley, Western Massachusetts.

This website includes information about the “Be a Local Hero” campaign that aims to increase production of locally-grown foods. A multimedia campaign manual is available for purchase.

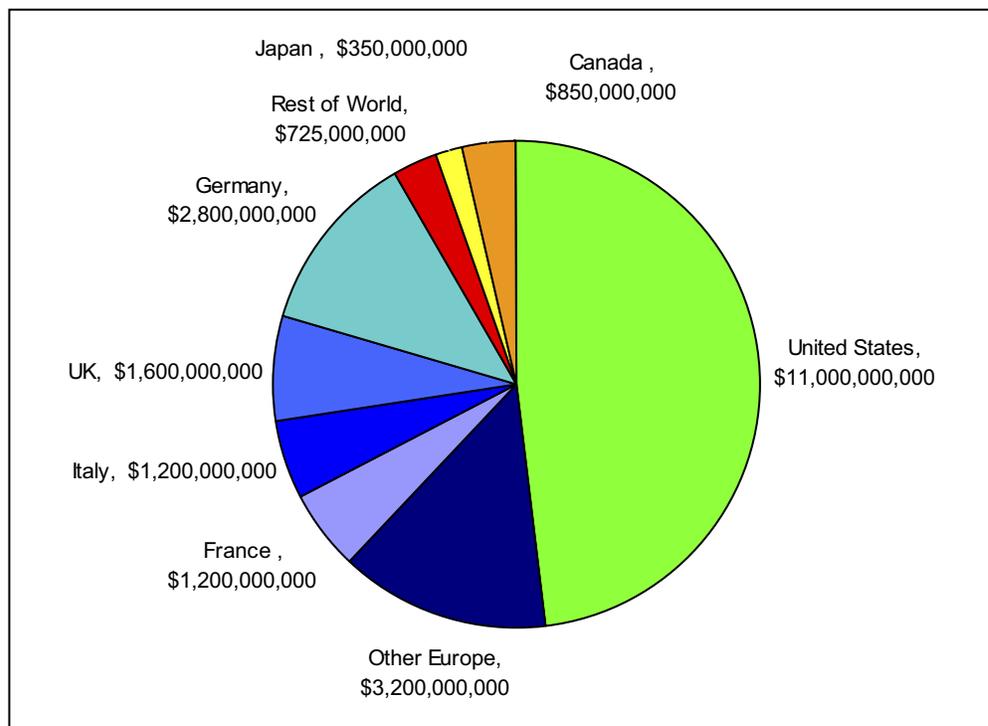
Available: <http://www.buylocalfood.com/about.html>

## Economics of Organic Agriculture

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Organic farming is one of the fastest growing segments of U.S. agriculture. Growth in retail sales has equaled 20% or more annually since 1990, pushing global sales to an estimated \$23 billion in 2002. Organic consumption in the United States accounts for roughly \$11 billion of total global sales (See Figure 1).

**Figure 1.** Global Sales of Organic Foods, Circa 2002



Fresh produce accounts for 42% of total organic food sales in the United States. Nondairy beverages, breads and grains, packaged foods, and dairy are the other top-selling food categories (Dimitri and Green, 2002). Three main venues are used for the sale of organic food in the U.S. – natural food stores, conventional grocery stores, and direct-to-consumer markets. A small amount of organic food produced in the U.S. is exported. The Marketing section of this handbook provides information about markets in Nebraska, focusing on direct sales and local organic grain buyers.

## Organic Versus Conventional

A recent publication by the Economic Research Service (ERS, 2002) of the USDA entitled *Recent Growth Patterns in the U.S. Organic Foods Market*, sites several studies that compare the economics of organic and conventional farming systems. Several recent studies in the U.S. report that organic price premiums are key in giving organic farming systems comparable or higher whole-farm profits than conventional systems. Other studies indicate that organic systems are more profitable even without organic premiums because of lower input costs. A study of organic soybeans in the Midwest revealed that they were more profitable than conventionally-grown soybeans because of higher yields in dry areas and periods of drought and lower associated input costs. Of particular interest is that **NO studies have shown organic systems to be less profitable than conventional systems.**

As shown in Table 1 below, scientific studies across the U.S. have demonstrated the economic viability of organic cropping systems. Full citations for each study are given at the end of this section.

**Table1.** Yield and economic comparison studies of conventional and organic farming systems. Source: Delate et al., 2003

U.S. State	Year	Crops	Yields	Economics
South Dakota (Dobbs and Smolik, 1996)	1985-1992	Corn	No statistical difference between conventional and organic; Higher in organic in drought years	Cost of production (COP) similar to conventional; organic premiums were not calculated
South Dakota (Dobbs and Smolik, 1996)	1985-1992	Soybean	No statistical difference between conventional and organic	COP similar to conventional; organic premiums were not calculated
Pennsylvania (Hanson et al., 1997)	1981-1995	Soybean	No statistical difference between conventional and organic after 3 yr. rotation; higher in organic in drought years	COP 12% lower in organic across all rotations; organic premiums were not calculated
California (Clark et al., 1999)	1989-1996	Tomatoes	No statistical difference between conventional and organic	COP 5% higher in organic, but with organic premiums, superior economics with organic
New Jersey (Brumfield et al., 2000)	1991-1993	Tomatoes, pumpkin, sweet corn	Higher in conventional (statistics not shown)	COP higher in organic when previous crop costs (cover crops) and additional management over conventional (staking) included; net return per unit 5-16% higher in organic with organic premiums

Research at the Neely-Kinyon Long-Term Agroecological Research site in Iowa was conducted to examine the agronomic and economic performance of conventional and organic systems. Economic analyses from three years of production (1999-2001) indicate that both corn and soybean returns within the organic corn-soybean-oat and corn-soybean-oat-alfalfa rotations are significantly greater than returns in the conventional corn-soybean rotation. Table 2 shows the returns per acre for all crops within the three rotations. Both organic premium prices and government loan payments are included in the analysis to reflect the economic reality for Iowa's farmers.

**Table 2.** Returns to land, labor, and management (\$/a), by crop and rotation, 1999-2001. Source: Delate et al., 2003.

Rotation	Corn	Soybean	Oat	Alfalfa	Average
C-SB (conventional)	\$51	\$95			\$73
C-SB-O (organic)	\$264	\$470	\$125		\$286
C-SB-O-A (organic)	\$272	\$505	\$112	\$272	\$290

C = corn, SB = soybean, O = oat, A = alfalfa

### Price Premiums for Organic Grains, Oilseeds, and Legumes

The above comparisons of organic and conventional systems show that even though fresh produce tops organic food sales, grain and soybean farmers can also benefit from organic agriculture. Organic grains, oilseeds, and legumes are used as inputs to manufactured products, as feed grain, and as final food products such as rice and tofu. Crops include traditional grains and oilseeds such as corn, soybeans, wheat, barley, oats, and rice, as well as nontraditional crops such as millet, buckwheat, rye, and spelt. Many of these crops can be contracted prior to planting.

Table 3 shows the price premiums for organic grains and oilseed for the time period between 1995 and 2000. Premiums are reported as the percent higher than prices for the conventionally produced equivalent.

**Table 3.** Price premiums for organic grains and oilseed: 1995-2001 [% above conventional crop prices]. Source: Bertramsen and Dobbs, 2002

	1995	1996	1997	1998	1999	2000	2001
Corn	35	43	73	88	98	89	59
Soybeans	114	85	141	202	217	175	177
Spring Wheat	54	59	73	8	87	103	94
Oats	35	59	73	83	77	71	41

## What about GMOs?

Most Nebraska farmers currently use several types of GMO seed, the most common being Round-up Ready® soybeans, Round-up Ready® corn or *Bt* corn. Reduced herbicide and insecticide costs are often cited as primary reasons for the use of these technologies. Because GMOs are not allowed in organic production, farmers may be skeptical about the profitability of farming corn and soybeans organically. A study done by Michael Duffy at Iowa State University reveals that Iowa corn and soybean farmers are not benefiting economically from the use of GMO crops. In fact, Duffy states that, "Today the primary benefactors of biotechnology are the seed companies and chemical companies." Table 4 shows some of the costs of production and returns to labor and management based on 2000 crop price averages.

**Table 4.** Comparison of returns to Iowa farmers for GMO and Non-GMO crops for the 2000 crop year. Source: Duffy, 2001.

	<b>Soybeans</b>			<b>Corn</b>	
	<b>Herbicide-Tolerant</b>	<b>Non-Herb. Tolerant</b>		<b>Bt</b>	<b>Non-Bt</b>
# of Fields	108	64	# of Fields	46	128
Yield	43.4 b/a	45.0 b/a	Yield	152 b/a	149 b/a
Seed Costs	\$25.56/a	\$21.21/a	Seed Costs	\$33.05/a	\$28.74/a
Herbicide Costs	\$19.96/a	\$26.15/a	Fertilizer Costs	\$53.30/a	\$48.67/a
Total Weed Mgmt Costs	\$27.14/a	\$34.80/a	Total Non-land Costs	\$207.25/a	\$197.00/a
Return to Labor and Mgmt	-\$8.87/a	-\$0.02/a	Return to Labor and Mgmt	-\$28.28/a	-\$25.20/a

These results show that the use of GMO seed is not necessarily linked to increased profits. This fact is important for conventional corn and soybean farmers considering the economics of organic production.

## Calculating Your Costs for Organic Production

For a farmer to calculate costs of production and returns for an organic system, one method is to start with the annual publication from Cooperative Extension on costs of production of field crops (EC-xxxx). We all know that each farm differs in actual costs of each operation, but this publication gives a general guide to costs and can be modified according to individual experience and personal circumstances. The method is to make a detailed cropping system budget of the current crop rotation along with all

associated costs. Then remove those costs that involve fertilizer and chemical materials and applications costs and add in cover crop seed and planting costs and additional cultivations or whatever else will change in the potential organic system. Most difficult will be calculating projected income, since prices fluctuate widely, and the best would be to talk to dealers to find out the most probable estimate of crop prices. Using projected yields from discussions with other organic farmers or from experience, it should be possible to project costs and returns for your farm. The Extension Circular with this information on costs of production is available from Cooperative Extension offices, or on the web:  
Available:

## References and Resources

### **Recent Organic Growth Patterns in the U.S. Organic Foods Market**

By Carolyn Dimitri and Catherine Green

Economic Research Service (ERS) Agriculture Information Bulletin

No. AIB777 September, 2002

Available: <http://www.ers.usda.gov/publications/aib777/>

### **Comparison of Prices for 'Organic' and 'Conventional' Grains and Soybeans in the Northern Great Plains and Upper Midwest: 1995-2000**

By Bertramsen and Dobbs, Econ Pamphlet 2001-1. (2002)

South Dakota State University.

### **An Economic Comparison of Organic and Conventional Grain Crops in a Long-term Agroecological Research (LTAR) Site in Iowa**

By Kathleen Delate, Michael Duffy, Craig Chase, Ann Holste, Heather Friedrich, and Noreen Wantate (2003)

American Journal of Alternative Agriculture Vol 18 (2): 59-69.

Available:

<http://extension.agron.iastate.edu/organicag/researchreports/orgeconomics.pdf>

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